THE AMERICAN

JOURNAL OF PHARMACY.

AUGUST, 1876.

ON FLUID EXTRACT OF IPECAC.

BY HARRY C. WATT, PH.G.

(*Extract from an Inaugural Essay.*)

The principal use of fluid extract of ipecac is for making syrup, hence all preparations other than those which will make a good and permanent syrup, no matter what other good qualities they may have, should be rejected, and those which will make the most perfect syrup should be adopted. The officinal fluid extract of 1870 contains the inert resin[1] in solution, to the removal of which the "Pharmacopœia" of 1860 paid so much attention. The prevailing opinion is, that it is not hard to improve on the present formula, for the preparation soon becomes very thick upon standing.

The formula of Mr. Richard V. Mattison, published in the "Amer. Jour. Pharm.," 1873, p. 481, furnishes a good preparation, but unless there is extra care used in manipulation, the proper strength of the drug would not be represented. Moreover, the preparation itself is not entirely free from the objections common to this preparation, for in spite of the most careful manipulation it will precipitate. The syrup made therefrom shows a resinous separation after standing a long time, which seems to be the case, to a small extent at least, in the best preparations of this syrup. I believe, however, Mr. Mattison's preparation to be almost as near perfect as can well be obtained. The working formula can, however, be improved upon.

The writer prepared fluid extract of ipecacuanha by four different processes, but in each case the drug was similarly treated as to fineness

[1] This so-called resin is most likely a decomposition product of the pectin contained in ipecacuanha.—EDITOR.

of powder, length of time in maceration previous to percolation (four days), packing in conical glass percolators, and temperature used in evaporation, as directed by the "Pharmacopœia." Calculated for 16 troyounces, which quantity, however, was not used except in one case, the menstrua and manipulations were as follows:

1st. Acetic acid, f℥i; water, 3 parts; alcohol, 1 part. The powder was moistened with the whole of the acetic acid, mixed with sufficient of the alcoholic menstruum; after maceration as above stated, exhausted with the menstruum (quantity obtained?—Editor); the percolate, after adding glycerin f℥i, was evaporated to 1 pt. and filtered.

2d. *U. S. P. menstruum*, exhausted and evaporated to nearly solid consistence, added sufficient water to make f℥viii; then added glycerin f℥i, the whole thrown upon a filter and water passed through the filter till the filtrate measured f℥xv, lastly added glycerin q. s. to make 1 pt. After allowing it to stand 24 hours, again filtered.

3d. *Menstruum Alcohol.*—Percolated drug till half pt. of percolate was obtained; set this aside, and continued the percolation with glycerin and water, 1 part of the former to 7 of the latter, until drug was exhausted; the two percolates were then mixed and let stand for 24 hours, the heavy precipitate filtered out and continuously washed; filtrate, after standing 24 hours, again filtered, the second filtrate evaporated to syrupy consistence, then f℥viii alcohol added to separate gummy matter; evaporated off about two-thirds of the alcohol, upon cooling it gelatinized.

4th. *Exhausted by U. S. P. process*, threw the percolate into four times its bulk of water; filtered at once, let stand 24 hours, and again filtered; added the glycerin and evaporated to desired bulk.

In each case the amount of resinous extractive matter, separated from the various percolates by evaporation or other means before the preparations were completed, was carefully noted as follows:

From No. 1,	. .	840 grains.	
" " 2,	. .	160 "	
" " 3,	. .	265 "	(the unfinished prep.)
" " 4,	. .	1065 "	

In order to test the merit of each menstruum as to its power of exhausting the drug, the dregs of each operation above named were exhausted with alcohol, the percolate evaporated to a solid extract and

weighed. From the various dregs I obtained amounts of extract as follows:

No. 1, 120 grs., entirely soluble in alcohol, insoluble in water.
" 2, 112 grs., soluble in alco., insoluble in water, gummy, resinous.
" 3, 138 grs., contained considerable glycerin, semi-fluid.
" 4, 95 grs., freely soluble in alcohol, insoluble in water.

Of all these preparations I prefer most decidedly No. 4. The preparation represents the medical virtues of the drug, and the syrup made therefrom six months ago still remains clear and transparent, having no signs of precipitation.

The syrups made with the extract from process No. 1 precipitated slightly, but fermented; with No. 2, a precipitate was formed soon after preparation; no syrup made with No. 3. Of the fluid extracts, Nos. 1 and 2 have copious precipitates, but No. 4 is perfectly transparent, and free from sediment of any kind.

I cannot see that there is any special advantage in using acetic acid; there may be a disadvantage, which Prof. Maisch has once hinted at ("Amer. Journ. Pharm.," Feb., 1871). He says "that acetic acid, in contact with organic bodies, is very liable to undergo decomposition; and, since an organic body in such a condition is apt to predispose others with which it may be in direct contact to similar changes, it is a matter of great moment whether the addition of acetic acid to our officinal fluid extract of ergot and ipecac may not be more detrimental than useful." On the contrary, Prof. Procter suggested that change seems to be arrested by the introduction of acetic acid to such preparations, whose active principle in the natural condition seems to be held loosely by a weak acid, upon the principle (not entirely proven) of the substitution of a more permanent acid for a less permanent one. Dr. Squibb corroborates this idea in his note on "Ergot," published in the "Proceedings of the American Pharmaceutical Association," 1873, p. 641, where he says that the addition of 1 per cent. of acetic acid to the fluid extract of ergot renders this liquid preparation permanent and without apparent change in activity, after keeping it for six years. My experiments with ipecac seem to substantiate the opinion of Prof. Maisch. The preparation containing acetic acid, after keeping it a few months, began to change; both the fluid extract and the syrup made therefrom by this time (six months) seem to have undergone

thorough decomposition, while the other preparations exposed to the same influences are still in a good condition.

I may as well state here, that Mr. Campbell's process was tried, but with no success whatever. The drug, it is true, was pretty well exhausted (this is what Mr. C. claims principally for his process), and very well represented in the product, which was at first very pretty and transparent, but in a short time the separation commenced and continued on, until now it is a very muddy and unsightly preparation.

PHARMACEUTICAL NOTES.

BY CARL S. N. HALLBERG, PH.G.

(*Abstract from an Inaugural Essay.*)

Medicated Waters.—The magnesia process has some advantage in making a clear preparation when finished, but, as the object is to have a pure medicated water, this process is not desirable, as the water is not free from magnesia.

The hot water method has not this objection. I have tried several modi operandi, of which the following is the most satisfactory:

Pour boiling water in a strong bottle or, preferably, a demijohn, drop the requisite amount of oil on a folded filter, and put this filter in the hot water. Upon agitation the filter will be reduced to a pulp, and the oil readily dissolved. After standing a day or two, occasionally shaking it, filter, if necessary, through more pulp.

This water is, perhaps, not quite as clear a preparation as the product of the magnesia process, but is unquestionably superior.

In *Camphor Water*, the magnesia process may also be dispensed with to an advantage. I have obtained satisfactory results by powdering camphor with sufficient alcohol, then triturating with water gradually added, and filtering after several days.

For *Soap Liniment*, the use of castor oil soap has been advocated in some journals, which would, no doubt, answer the purpose admirably. The following modified formula of the "Pharmacopœia," with my experience has worked well:

Take of	Castile soap, . .	4 troy ounces,
	water, . . .	14 fluidounces,
	camphor, . .	2 troy ounces,
	ol. rosemary . . .	½ fluidounce,
	strong alcohol, . .	1½ pint.

Grate the soap on a common grater, and, having mixed the water with ½ pint of alcohol, pour this on the soap; with occasional agitation it will dissolve in a short time. Dissolve the camphor and oil of rosemary in remainder of alcohol. Add this to the solution of soap, let stand some time and filter. The result is a preparation which will not precipitate. It is not as strongly alcoholic as the officinal, but it contains as much alcohol as is compatible (? Ed.) with it as a preparation.

Aromatic Sulphuric Acid.—The writer recommends S. Whittier's formula ("Am. Jour. Pharm.," 1874, p. 509).

Syrup of Tolu.—In filtering the mixture of tincture of tolu, magnesium carbonate and water, nothing but a flavored water is obtained, as the resin upon which the medicinal virtues depend is left in the filter. It is, therefore, a sacrifice of the medicinal virtues of tolu for the sake of getting an elegant preparation. I have tried to combine the medicinal as well as pharmaceutical properties, and believe to have succeeded, by the following formula: Take the required amount of tincture of tolu, magnesium carbonate and a small quantity of sugar, rub them together and, instead of adding water, add simple syrup (hot), sufficient to make the desired quantity of syrup. After standing a short time, strain slowly through flannel.

Syrup of Ginger may also be made advantageously by this process.

Syrupus Aurantii Corticis.—As this preparation is mostly used as a pleasant vehicle to disagreeable medicines, and especially those derived from iron, I submit a formula, which has the decided advantage in affording a preparation which will not be discolored by an iron preparation. One precaution is necessary, to use a fresh oil; the best plan is to make it up into spirit of orange at once, one part of oil to fifteen of strong alcohol.

Take spirit of orange, carbonate magnesium, sugar and water, and proceed in the same manner as for preparing the syrup of tolu of the "U. S. Pharmacopœia," using the same proportions.

Aromatic Syrup of Rhubarb, as prepared after the officinal process, is generally an unsightly preparation.

I have found the officinal process, with some slight modification, renders a satisfactory preparation. After exhausting the rhubarb, &c., with the alcoholic menstruum, rub it up in a mortar with a small quantity of carbonate of magnesium and some sand. Pack this

loosely in a funnel and percolate it with the water that goes to make up the syrup, mixed with a small quantity of glycerin. Dissolve the sugar in this last percolate, and, while still hot, add the aromatic tincture of rhubarb. The result is a transparent syrup of a beautiful red color, and it will not precipitate.

Syrup of Ipecacuanha.—In simply mixing the fluid extract with syrup a very unsightly preparation is obtained, the resin being precipitated. The following formula affords a much nicer product: Mix the fluid extract with water, let stand and filter out the precipitated resin, dissolve the sugar in the filtrate, and strain.

Tincture Kino.—The writer recommends R. Rother's process ("Am. Jour. Pharm.," 1873, p. 398).

Syrup of Squill.—An important point has been overlooked in the formula for this preparation. As vinegar of squill contains a considerable amount of albuminous matter, it ought to be first brought to the boiling point, when the albumen coagulates and can readily be skimmed off; the sugar should then be dissolved at a low temperature.

ESSENCE OF VANILLA.

GEORGETOWN, D. C., July 12, 1876.

EDITOR AMERICAN JOURNAL OF PHARMACY:—

Enclosed please find formula for essence vanilla, which gives me a better result than any I have ever tried:

Take of vanilla beans, . . . 8 oz.
cut loaf sugar, . . . 72 oz.

dilute alcohol a sufficient quantity. Slice and cut very fine the vanilla beans, then, with the sugar gradually added, reduce in a wedgewood mortar to a coarse powder (it should pass freely through a sieve of 20 meshes to the inch), pack this into a cylindrical glass percolator, and *very slowly* displace with dilute alcohol 1 gallon of percolate. The first of this percolate is a dark syrup, and, if the process is carefully conducted, the last few ounces of the gallon will pass almost void of color or vanilla flavor. Yours, &c.,

CHAS. BECKER.

POWDERED DRUGS UNDER THE MICROSCOPE.

BY MARK W. HARRINGTON, M.A.
Assistant Professor of Botany in the University of Michigan.

(*Continued from page* 300.)

III. NATURAL POWDERS.

By this title is meant powders which have not been made by crushing or grinding. There are two pharmacopœal substances of this sort in common use, viz., lupulina and lycopodium.

I. LUPULINA (Fig. 7).

Lupulin is a powder consisting of glands scraped from the surface of the bracts of the fertile cone of the hop. The powder is light and volatile. Its color is golden yellow, becoming more orange with age. It has the odor of hops and a resinous taste. When thrown in a flame it flashes. It is not wetted by water; is readily so by alcohol or ether; with sulphuric acid it gives off a strong odor of hops.

The glands consist each of two cup-shaped membranes, set edge to edge and enclosing a mass of brown-yellow resin. In the figure given three of these cups have been separated from the corresponding ones belonging with them. One of these is seen from the side. We look down on the two others. The fourth has the two hemispheres set together, but the hinder one does not appear plainly. The lower membrane is less conical than the upper, and is composed of flattened cells, radially arranged. Sometimes a short stalk is attached to it. The upper membrane is more delicate and less distinctly cellular than the lower. When fresh it is hemispherical, but as volatile portions inside the gland evaporate, this membrane contracts until it finally looks like a stem to the lower portion, the whole presenting the appearance of an umbrella, or rather a thick-stemmed toadstool. This change in shape in the gland, from nearly spherical to

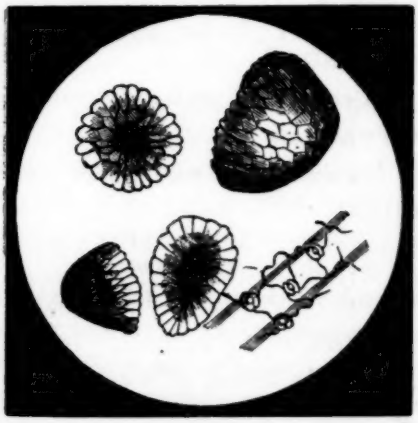

Fig. 7. Lupulina.

toadstool-like, takes place as the powder becomes old and dried. The diameter of the glands is about 75*tt*.

Along with these glands are found fragments of the surface membrane (epidermis), scraped off with them. The figure shows a fragment of this epidermis, with its cells and breathing pores. Separate fragments of resin, with occasional crystals of the same, are found. Hairs from the hop are also sometimes present.

The fragments of epidermis and hairs are impurities, and should not be abundant. Lupulin sometimes contains sand. This can be easily separated by water, in which the powder floats, while the sand sinks. When the grains have so far dried as to become toadstool-shaped, and orange-yellow in color, the powder has lost its valuable properties.

2. LYCOPODIUM (Fig. 8).

This is a very fine and volatile powder, made up of the spores (seed-like bodies) of the common northern club moss (*Lycopodium clavatum*). The powder is of a light yellow color, odorless and without taste. It does not mix with water, but readily mingles with alcohol, ether, chloroform, etc. Thrown into a flame, it flashes brightly, but in the mass it does not fire readily. It does not turn blue with iodine, nor with iodine and sulphuric acid.

Each grain or spore is a three-sided pyramid, with a convex base. It looks as if it was cut out of a sphere by three planes, each of which passed through the center. In one of the grains represented in the figure we are looking directly down on the apex of the pyramid. In two of the others, we view the pyramid a little from one side. In the remaining two, we are looking at the convex base of the grain. A groove runs down each angle from the apex. The true nature of the markings on the surface cannot be made out without some care. When carelessly focussed, the grains appear to be covered with hairs of peculiar shape, better seen at the edges. If

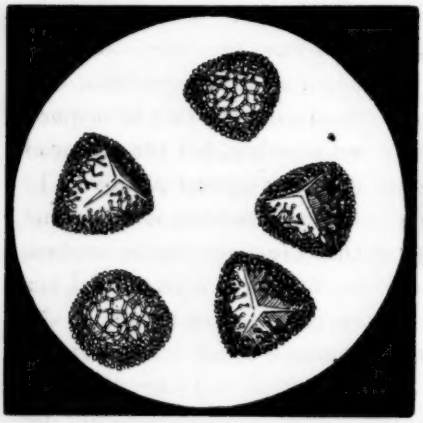

Fig. 8. Lycopodium.

the grains are flattened out by pressure, it is found that the markings are really rather irregular six-sided meshes. The same thing can be seen, at a few points at a time, after the grains have been carefully brought into focus.

Each grain consists of a single cavity or cell, surrounded by a double membrane. This is hard to demonstrate, but can sometimes be seen by crushing beneath the thin glass cover. The outer membrane or bag is thicker and brittle, and bears the markings; the inner is thinner and more elastic and is smooth. Within the membrane is a thick liquid with drops of oil. The latter are easily recognized under the microscope. They have a spherical form, and appear bright, especially at the center, because the light is highly refracted by them.

Lycopodium has the reputation of being frequently adulterated, but the writer, in the numerous samples he has examined, has always found it pure, except in one. This contained potato starch, easily recognized by its turning blue with iodine, and by its microscopical characters. In the case mentioned, fully one-third of the powder was starch.

The adulterations given by Soubeiran and others will be given and briefly described, as they may be met in the United States. Ground wood can be recognized by its microscopical structure. It can be separated by a fine sieve. Ground talc can be recognized by its shining, flaky fragments, needing a microscope to distinguish them when ground fine. It can be separated by water, in which the talc sinks and the lycopodium floats. Sulphur consists of irregular or crystalline fragments, which have its characteristic yellow color. When lycopodium, with it as an adulterant, is burned, an odor of sulphurous acid is given off. When adulterated with dextrin, it becomes lumpy when exposed to moisture. Benj. Lillard has detected this adulteration in this country. Lycopodium is also sometimes adulterated with pollen. That of the pines is characterized by being three-lobed—the larger, arched, middle lobe connecting the two others. With this adulteration, the powder has a slight odor of pine. It does not seem to be injured for the uses to which it is put. One such adulteration, found in Ann Arbor, has been reported to me. The pollen of cat-tail flag, or *Typha*, is said to be also employed. The powder is then less inflammable, and has a deeper yellow color. The grain of pollen consists of four equal lobes.

ON THE PREPARATION OF MONOBROMATED CAMPHOR.

BY T. C. LINTHICUM, PH.G.

(*From an Inaugural Essay.*)

The author has compared three different processes, which have been recently recommended for the successful preparation of monobromated camphor, namely, those of J. M. Maisch ("Am. Jour. Pharm.," 1872, p. 337), J. U. Lloyd (Ibid, 1875, p. 165) and of Ed. Dubois ("Proc. Am. Phar. Assoc.," 1875, p. 328). The latter process is similar to that of Gault ("Am. Jour. Pharm.," 1874, p. 587), from which it differs mainly in the treatment of the crude article with carbonate of sodium, and in the asserted almost complete absence of any by-products. According to Dubois, 75 grams of camphor are introduced into a retort, and 80 grams of bromine at once added. The two substances unite with a slight elevation of temperature and become liquid. After standing for two or three hours the mixture is heated by means of a water bath, to 100° C., and when the reaction is completed the contents of the retort are treated with a warm solution of carbonate of sodium, then dissolved in boiling alcohol, filtered and allowed to crystallize.

Having carefully manipulated according to each of the three processes, I feel justified in submitting the following results. My first experiment, made with the process of Prof. Maisch, confirms the result obtained by him in 1872. By the process of Mr. Dubois I was unable to obtain crystals of monobromated camphor. But, upon heating the resulting mass to 132° C. and treating with hot benzin, I succeeded in obtaining handsome, large, needle-shaped crystals. In making the experiment according to Mr. Lloyd, who directs a little over one atom of bromine to one molecule of camphor, I used an apparatus constructed upon the same plan as that employed in the first process, and found that the alkaline carbonate in the receiving vessel was but slightly affected, owing to the small amount of hydrobromic acid which was liberated. After many fruitless attempts to crystallize the brownish, oily mass resulting from this operation, either from warm alcohol or benzin, I transferred it to a retort, and, after heating it to 152° C., crystalized the contents from hot benzin, when crystals of monobromated camphor were obtained, and a large amount of an oily product.

The experiments made have satisfied me that two atoms of bromine are required for one molecule of camphor, and that monobromated camphor is best formed at a temperature not below 132° C.

SALICYLIC ACID.

BY FLAVIUS S. CASE, PH.G.

The author's inaugural essay treats of the chemical history of salicylic acid; of its solubility in various menstrua, its medicinal and other properties. The results of his experiments, made with the view of testing its preservative properties are contained in the following table:

Preparation:	Kept unchanged for the number of days mentioned below, after dissolving in 1 fl.oz.							
	Pure Prepa-ration.	Salicylic Acid.					Glycerin.		½ gr. Salic Acid
		1-32 gr.	1-16 gr.	1-8 gr.	1-4 gr.	1-2 gr.	℥ i	℥ ii	℥i Glyc.
Mucilago Acaciæ	8 days	50 days	75 days	90 days	.....	.....	20 days	35 days	.....
Syrupus Rubi Idæi	10 days	.....	.....	70 days	.....	.....	.....	.....	.....
Syr. Papaveris, Ph. Germ.	6 days	.....	.....	.....	.....	12 days	.....	.....	20 days
Syr. Limonis	7 days	.....	.....	.....	30 days	.....	.....	.....	.....
Infus. Digitalis	10 days	.....	.....	.....	50 days	60 days	.....	.....	.....

In each case the experiments were made with five or six vials, all of which were uniformly exposed, the temperature ranging between 70° and 90° F.

BENZOIC ACID AS AN ANTISEPTIC.

BY HENRY TRIMBLE, PH.G.

(*Abstract from an Inaugural Essay.*)

For the purpose of investigating this property, claimed for benzoic acid, two samples were employed—one obtained by sublimation, according to the U. S. P. process, and the other purchased under the name of "artificial" benzoic acid, supposed to have been prepared from hippuric acid. A good commercial salicylic acid was also procured, which, with the above-mentioned samples, formed the basis of the following experiments, in one-half of which both the sublimed and artificial benzoic acids were used and found to be identical in antiseptic power; the remaining experiments were therefore made with the artificial acid only. The results of the writer are condensed in the following table:

One part of	2000 parts Infus. Buchu	4000 parts Inf. Buchu	8000 parts Inf. Buchu	2000 parts Inf. Colombo	2000 parts Inf. Gentian. simpl.	1000 parts Solution of Albumen [1 in 16 water]	4000 parts Solution of Albumen
Salicylic acid	Spoiled in 8 days	Spoiled in 4 days	.....	Spoiled in 6 days	Spoiled in 19 days	Spoiled in 12 days	Spoiled in 10 days
Benzoid acid	Remained unaltered after 60 days	Spoiled in 16 days	Spoiled in 5 days	Cloudy, but no change of color in 16 days	Unaltered after 30 days	Unaltered after 60 days	Spoiled in 19 days

To ascertain the power of salicylic and benzoic acids to arrest decomposition, they were each added in proportion of one part to 2000 of separate portions of cider which had commenced to ferment. In both cases the fermentation, after twenty-four hours, had entirely ceased, and both were perfectly sweet at the end of fifty days, without the appearance of any further decomposition, a rather copious precipitate having separated at the bottom of each.

It must be remembered that the infusions in the above experiments, without the addition of an antiseptic, would have commenced to decompose in about twenty-four hours, and the solution of albumen in about forty-eight hours. In all cases the operations were conducted in a moderately warm place, so as to favor a change as rapidly as possible.

Having carefully compared the above experiments and their results, the following conclusions are submitted:

1. That benzoic acid, sublimed or artificial, possesses valuable antiseptic properties.

2. It has the power to arrest decomposition.

3. Tannic acid (of buchu?) does not interfere with its preservative properties.

4. As an antiseptic, it is superior, in many, if not in all cases, to salicylic acid. It also has the advantages of being more readily obtained in a state of purity, of being more soluble, and having a lower commercial value.

SIUM LATIFOLIUM, *GRAY.*

BY ANDREW R. PORTER, PH.G.

(*Abstract from an Inaugural Essay.*)

An umbelliferous plant, growing in California and along the Pacific coast, in damp and marshy places, commonly known as wild parsnip, was brought to the notice of the people there about three years ago, by a man being poisoned by eating some of the root. The case was treated successfully by C. B. White, M. D., U. S. A. (see "Amer. Jour. Phar.," 1873, p. 371).

The root was subsequently sent to a former student of this College, Mr. Power, but arriving too late to be investigated during that session by him, was placed in the hands of Prof. Maisch, who very kindly gave it to me to investigate, and to obtain, if possible, the poisonous principle.

Sium latifolium has a short, upright root stock, varying in size from one-half to two inches or more in length, and about the same in diameter, so it becomes almost spherical in outline; bases of leaves are still attached to the crown. It presents a very rough, wrinkled appearance, and is of a gray or yellowish-brown color. It branches at once into a number of large roots, from four to twelve, and even more. These are of the same color, from $\frac{1}{8}$ to $\frac{1}{2}$ or $\frac{3}{4}$ inch in thickness, and 2 to 6 inches long, very much wrinkled longitudinally, somewhat flattened and contorted, and nearly uniform in thickness. On soaking in water, they become about twice as large. The dried root breaks with a very short fracture, is white inside, with a yellowish, spongy meditullium and numerous resin cells, which are plainly visible with the naked eye, scattered irregularly throughout the bark. The root has rather an agreeable aromatic odor, and a sweetish, aromatic and somewhat pungent taste.

In attempting to separate the proximate principles of the root, an alcoholic tincture was made, concentrated and precipitated by water. In the clear aqueous solution, Trommer's test indicated the presence of much *sugar*, besides some coloring matter. The precipitated oleoresin was distilled with water, the distillate containing some *volatile oil*, which was colorless, and had the aromatic odor and warm, pungent taste of the root. The soft residue was separated by hot petroleum benzin into a *fixed oil* and *resin*. The oil was thick, deep-red, of a slight odor and disagreeable taste, soluble in alcohol, chloroform, ether, oil of turpentine, benzin and carbonbisulphide.

The resin was easily rubbed into a reddish-brown powder, which had a very slight odor and but little taste, fusible when heated, and uncrystallizble, soluble in alcohol, chloroform and ether, insoluble in benzin and bisulphide of carbon. This resin appears to be the poisonous principle, since a small portion of it, given to a cat, produced in the course of two hours frothing at the mouth, considerable pain and then convulsions, from which, however, the cat recovered. This resin was not quite pure, since caustic potassa dissolved only a part, leaving a portion insoluble, and not fusible by heat.

The root exhausted by alcohol was found to contain *gum*, *albumen* and *pectin*, but no starch.

An alkaloid having been searched for, with negative result, in the alcoholic tincture, a decoction of the root was distilled with caustic

potassa. The distillate had an alkaline reaction, and its odor reminded of that of conium; but, when neutralized with an acid, the distillate was neither precipitated by tannin nor by iodohydrargyrate of potassium; it was probably *ammonia* contaminated with some odorous product of decomposition.

SOME PRACTICAL EXPERIMENTS WITH THE SUNFLOWER.

BY G. C. WITTSTEIN.[1]

Helianthus annuus is largely cultivated in Russia and Hungary, partly on account of the agreeable fixed oil and partly for the presscakes, which are a valuable fodder. 16,000 strong, healthy plants can be raised on one Bavarian acre (Tagwerk), which holds 3,407 square metres. By numerous experiments, it was ascertained that each individual weighs on an average 5¼ kilos, while fresh, and of this weight ¼ kilo is due to the seeds, one-half of the remainder (2½ kilos) being stem, and the other half (2½ kilos) leaves, receptacles and roots. The yield per acre is therefore 40,000 kilos of stem, 40,000 kilos of leaves, etc., and 4,000 kilos of fruit (seeds). The entire plant, deprived of the fruit, was cut fine, when, on drying in the air, it lost 68 per cent., and at 110°C. altogether 72·25 per cent., or nearly three-fourths of its weight; the remaining 27·75 parts left on incineration 1·9 parts of ashes, in which were found 62·199 potassium carbonate, 2·930 sodium carbonate, 7·000 potassium chloride and 2·772 sodium chloride, or altogether 74·901 per cent. soluble in water, and 25·099 per cent. insoluble in water, consisting of 4·210 calcium carbonate, 13·916 calcium phosphate, 0·672 aluminum phosphate, 0·323 ferric phosphate, 5·291 magnesia and 0·687 silicic acid. By leeching the ashes and evaporating the solution the resulting potash should contain 82·83 potassium carbonate; however, in consequence of a partial reaction with the calcium phosphate, the amount of carbonate was found to have decreased to 75·50 per cent., yielding still a good commercial potash.

Different samples of fruit yielded from 41 to 60 per cent. of shells, and from 40 to 59 per cent. of kernels, the latter yielding 16·25 to 28 per cent. of fixed oil, calculated for the weight of the fruit, or 40·6 to 50·5 per cent., calculated for the kernel alone. The oil was ex-

[1] Abstract from a paper published in "Archiv der Pharmacie," April, and communicated by the author.

tracted by ether; if obtained by pressure, of course considerably less would be obtained.

From the results obtained, as above, the author concludes that the cultivation of the sunflower would be profitable, inasmuch as a Bavarian acre would yield from the plants (deprived of the fruit) 1,525 kilos ashes, yielding 1,250 kilos of potash, and from the fruit, by extraction, 870 kilos of oil with 3,120 kilos of residue, or by pressure, 720 kilos of oil and 3,280 kilos of presscakes.

The air-dry fruit lost at 110°C. 6 per cent. of water and yielded 4·173 per cent. of ashes, 20·273 per cent. of which was soluble in water. It consisted of 14·475K_2O,4·714Na_2O,1·405Na,6·811CaO, 10·960MgO, ·227Al_2O_3, 1.427Fe_2O_3, 2·162Cl, 2·086SO_3, 31.848P_2O_5, 10·811SiO_3 and 13·074CO_2.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Princewood bark, a febrifuge of the Bahamas.—The name of princewood is given to two small West Indian trees, *Cordia gerascanthoides* Kth., nat. ord. Boraginaceae, and *Hamelia ventricosa*, Sw. nat. ord. Rubiaceae. Both are noted for their timber, which is lightish brown with dark brown marking, and used for table and cabinet work. Samples of princewood bark, recently received at the Kew Museum, were ascertained, by Mr. John R. Jackson, to be derived from *Exostemma caribæum*, R. S., nat. ord. Rubiaceae, which, according to Grisebach, is a fragrant shrub widely distributed in Jamaica, Antigua, Dominica, Trinidad, Cuba, Mexico and Guiana. The bark is smooth, of a deep reddish-brown, but somewhat greyish on the outside; under an ordinary lens, numerous small crystals are seen distributed over its surface. It breaks with a short, woody fracture; in flavor it is at first sweet, changing to an astringent bitterness; it readily tinges cold water to the color of dark brandy, and imparts to it, in a few hours, opaqueness, a strong, earthy smell and bitter taste. It has been known as the Jesuits' bark of Jamaica, and is sometimes called the seaside beach.

Exostemma floribundum and brachycarpum, likewise occurring in the West Indies, are called "quinquina piton," or "China caribæa" (Grisebach). *E. cuspidatum*, a small tree, native of Brazil, is there called "quino do mato;" *E. corymbiferum* is a native of the islands of

Pacific Ocean, and *E. philippicum* indigenous to the Philippine Islands; both have bitter medicinal barks.—*Pharm. Jour. and Trans.*, 1876, February 26.

Chelidonium majus.—E. Masing, of Dorpat, has made a large number of determinations of the moisture and alkaloids contained in the herb, root and fruit of this plant, which was collected during five succeeding months, in periods varying from three to ten days. The amount of moisture varied in the herb between 80·35 and 91.34 per cent., and in the root between 66·76 and 85·26 per cent. The total amount of alkaloids was determined by digesting 10 grm. of the fresh part of the plant with 25 cc. of acidulated water and 75 cc. of alcohol for 12 hours, the tincture evaporated to expel the alcohol and then diluted with water to 100 cc. 25 cc. of this solution was then titrated with Mayer's solution $\frac{1}{10}$, each cubic centimetre of which indicates 0·001675 grm. chelidonina; a separation of chelidonina and chelerythrina was not attempted, owing to the large number of determinations made. The amount of test solution required varied between 4·0 and 13·0 cc. for the herb, 4·4 and 16·2 cc. for the root and 5·3 and 9·7 cc. for the fruit.

The rapid decrease of the alkaloid at the beginning of flowering and the subsequent rapid increase appear to indicate that the alkaloids are used up for the formation of albuminous substances, which are deposited in the ovaries. Another cause of the vacillation is found in the weather, the consumption of the alkaloids exceeding their production during moist and rainy weather. A well-manured soil seems to favor their production, since the cultivated plant showed about double the amount of alkaloids, as compared with the wild plant, collected at the same time.—*Archiv d. Phar.*, 1876, March, 224–228.

Cotoin.—Julius Jobst received coto-bark from London in 1873 (see Amer. Jour. Phar., 1875, p. 541), and obtained last year a crystallizable body which appears to be the active medicinal principle of the bark. To obtain it the powdered bark is exhausted by ether, the tincture concentrated by distillation, the residue poured into a capsule and mixed with six parts of warm petroleum ether (light petroleum benzin). After the separation of a large quantity of resin, the benzin solution is poured off and allowed to crystallize. The crystals are collected, pressed and several times recrystallized from water. Thus prepared, cotoin forms yellowish-white, light prismatic crystals, has a very biting

taste, is sparingly soluble in cold, but more in warm water, and readily soluble in alcohol, ether, chloroform and carbon bisulphide. Benzol and petroleum benzin dissolve it less readily; it crystallizes from alcohol in large sulphur-yellow prisms, fuses at 124°C. (255·2°F.), and dissolves in alkalies with a yellow color, being reprecipitated by acids. Nitric acid dissolves it with a blood-red, sulphuric acid with a brown-yellow, and muriatic acid with a yellow color. The aqueous solution is neutral, yields with subacetate of lead a bright, yellow precipitate, and with iron salts a brown-red coloration or, when concentrated, a blackish-brown precipitate, and reduces in the cold, silver and gold salts, also Fehling's solution—the latter rapidly on warming. Its composition, according to an analysis by I. A. Todd, is $C_{21}H_{20}O_6$, and of its lead compound $C_{21}H_{20}O_6+2(PbH_2O_2)$.—*Neues Repert. d. Phar.*, 1876, 23–28.

Taxina.—W. Marmé obtained this poisonous alkaloid by exhausting the powdered seeds or leaves of Taxus baccata with ether, distilling off the ether and exhausting the residue with warm acidulated water. From the colorless filtrate, the alkaloid is precipitated by alkalies in snow-white flocks, which, when collected, form a white crystalline powder, which is soluble in acidulated water, alcohol, ether, chloroform, benzol and carbon bisulphide, but not in petroleum benzin. Concentrated sulphuric acid colors it red; other acids dissolve it without coloration. It is precipitated by all reagents characteristic for alkaloids, except by the chlorides of platinum, gold and mercury, and by platino-cyanide of potassium. It contains nitrogen, but crystallizable salts could not be obtained.—*Chem. Cent-albl.*, No. 11.

The Inula camphor of J. Kallen ("Amer. Jour. Pharm.," 1874, 298) has been further examined by the same chemist. It was obtained in the form of white crystals by distilling elecampane root with steam. On pressing the crystals between bibulous paper, and distilling the latter with water, a yellowish liquid, *alantol*, is obtained, having an aromatic taste and the odor of peppermint, and boiling near 200° C. Its composition is $C_{10}H_{16}O$.

The crystals remaining after pressing, are repeatedly crystallized from dilute alcohol, when they form colorless prismatic needles, of a faint odor and taste, fusing at 66° C. and sublimable, readily soluble in alcohol and ether, but slightly in water. It is the anhydrid of a new acid (*alantsäure*) of the formula $C_{15}H_{20}O_2$; the acid is $C_{15}H_{22}O_3$, crys-

tallizes in fine needles, fuses at 90—91° C., and yields rather unstable crystallizable salts.—*Ber. Deutsch. Chem. Ges.*, 1876, 154—157.

Hesperidin.—Emanuele Paterno and Giovanni Briosi have obtained this principle pure by a modification of Pfeffer's process. The cut and bruised oranges are covered with diluted alcohol, potassa solution is added in excess, the liquor filtered after two days and impure hesperidin precipitated by muriatic acid; the precipitate is boiled with acetic acid for 8 or 10 minutes, and, after cooling, filtered from the dark resinous mass. After two days the filtrate commenced to separate white, fine needles and spheric crystals of nearly pure hesperidin, the separation continuing for several months. Four thousand ripe oranges yielded about 180 grams of hesperidin, which was also obtained from the ripe fruit of Citrus limonum and C. medica. It fuses between 243° and 245°C., is nearly insoluble in the simple solvents, but soluble in alkalies and in anilin, from which it is precipitated by ether.—*Ber. D. Chem. Ges.*, 1876, 250–252.

Oil of Parsley.—Trommsdorff obtained from 15 kilos parsley fruit 90 grams, and by shaking the aqueous distillate with benzol, 16 grams more of the volatile oil, which was examined by E. von Gerichten. It commenced to boil at 160°C., nearly all the terpen having come over below 210°. Between 270° and 290° a heavy yellowish-green, very refractive, uncrystallizable liquid was obtained, and above 300°C. brown decomposition products. By repeated rectification of the first portion, the pure, colorless terpen was obtained, boiling between 160° and 164°C., and having an intense odor of parsley. Its specific gravity at 12°C. is ·865, and its rotation power for yellow light and a column of 100 mm. = —30·8°. Muriatic acid colors it gradually brown and destroys the parsley odor. Terpin and solid chlorhydrates could not be obtained.—*Ibid.*, 258–260.

The Conversion of Brucia into Strychnia by means of nitric acid, as reported by Sonnenschein ("Am. Jour. Phar.," 1875, p. 345), does not appear to be as readily effected. A series of experiments, made by A. J. Cownley, led him to the conclusions, that 1, if brucia be treated with enough dilute nitric acid to acidify the solution, there is no change in color, and caustic fixed alkalies precipitate the alkaloid; 2, if enough acid be used just to form the red color without the aid of heat, there is a partial precipitation with akali; 3, if gentle heat be used in presence

of acid in excess, more than sufficient to color the solution, caustic alkali fails to produce a precipitation, and if further heat be used after the acid has been added, yellow crystals soluble in alkali are deposited. These results point to the production of a nitro-compound, probably of Laurent's cacothelin ("Am. Jour. Phar.," xix, 237; xx, 115). The results further prove that the detection of brucia, and even of strychnia, in an analytical inquiry will become doubtful, if the presence of nitric acid, even dilute, be permitted. *Phar. Jour. and Trans.*, April 22, p. 841. (See also papers by Rosengarten, *Am. Jour. Phar.*, xx, 114; Baumert, *Ann. d. Chem. u. Phar.*, lxx, 337, and Strecker, *Comp. Rend.*, xxxix, 49.

Amyrin.—Eugene Buri obtained amyrin by treating elemi with cold 90 per cent. alcohol, and recrystallizing the residue repeatedly from hot alcohol. It forms colorless silky needles, united to globular masses, fuses at 177° C. and congeals, far below the melting point, to a transparent, resinous mass, which crystallizes again from alcohol. It is soluble in ether, and freely in chloroform and carbon bisulphide. 100 parts of alcohol of 92·5 per cent. dissolve at 16° C. (60·8° F.) 3·6 parts. Its alcoholic solution affects polarized light + 4·5°. It is sublimable when carefully heated in thin layers. Ultimate analysis gave results agreeing with the formula $C_{25}H_{42}O=(C_5H_8)_5.H_2O$, to which also the acetyl substitution product points. By the action of nitric acid, oxalic and an amorphous resin acid were obtained. The products of destructive destillation could not be separated into bodies of uniform boiling point; the first portion had an agreeable odor and aromatic taste.—*Buchner's N. Repert.*, 1876, 193–203.

Alkaloid from Capsicum.—J. C. Thresh treated the fruit of Capsicum fastigiatum, deprived of their non-acrid seeds, with benzin, which yielded 20 per cent. of a red fatty substance, of intense acridity. This was dissolved in ether, the solution shaken with dilute sulphuric acid, the free acid partially neutralized with barium carbonate, filtered, evaporated, and the oily residue treated with alkali and agitated with ether. On evaporating the ether, a small quantity of an oily alkaloid was obtained, smelling somewhat like conium, having a mawkish, persistent, but not acrid taste, and yielding crystals on being combined with HCl and SO_3. The alkaloid is undoubtedly the one observed by Felletár in 1868, and since then confirmed by Dragendorff and Flückiger.—*Pharm. Jour. and Trans.*, May 27, p. 941.

CONTRIBUTIONS FROM THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Communicated by PROF. ALBERT B. PRESCOTT.

I. *The Preparation of Liquor Ferri Nitratis.* By F. T. BOWER, Ph.C.

This solution, made by the U. S. P. process, is variable in two particulars, namely, in the proportion of iron to the solution, and in the proportion of acid to iron. From the last-named variation the ferric salt may be more or less basic or possibly normal. As with other ferric salts, the more basic the darker its color; the normal salt in solution of U. S. P. strength being very light in color, and in presence of free nitric acid almost colorless. The "Pharmacopœia" specifies its color as pale amber; but if the iron be dissolved in strict compliance with the directions, the finished solution is darker than pale amber—and this is true of the solution commonly in use. By the addition of nitric acid it can be made pale, in proportion to the amount added. The causes of the variation lie, firstly, in the uncertain action of iron on the cold dilute nitric acid; slight differences in temperature and differences in the equilibrium of the nitric acid change the decomposition products of the acid and the proportion of ferrous nitrate it can make. Even if the direction to avoid red fumes be so strictly obeyed that no trace of nitric oxide is formed, we may have the acid breaking up in at least three different ways, as follows:

$$4Fe+10HNO_3=4Fe(NO_3)_2+NH_4NO_3+3H_2O$$
$$4Fe+10HNO_3=4Fe(NO_3)_2+N_2O+5H_2O$$
$$Fe+2HNO_3=Fe(NO_3)_2+2H$$

Again, the action of the second portion of nitric acid, added to change the ferrous to a ferric salt, will be varied by conditions. The chief decomposition product is undoubtedly nitric oxide, but other products may occur to some extent. In using nitric acid to make ferric solutions of sulphate and chloride, we know, by experience, that the only exact direction is to add *sufficient* nitric acid, and afterward expel any excess; but here, with a variable quantity of ferrous nitrate to act upon (to oxidize and then make normal), we have no guide but to heat to 130° and add the two troyounces of nitric acid.

The "Pharmacopœia" directs that one fluidounce of the solution shall furnish "from eight to ten grains" of ferric oxide. Five samples of the solution were assayed, the first two obtained at drug stores,

and the last three prepared for the purpose according to the U. S. P., but in smaller quantities:

One	fluidounce	of	No.	1	gave	12·69	grains	ferric oxide.
"	"	"		2	"	11·99	"	" "
"	"	"		3	"	16·93	"	" "
"	"	"		4	"	11·28	"	" "
"	"	"		5	"	8·46	"	" "

An attempt was made to prepare the solution of nitrate of iron by adding solution of tersulphate to an alcohol solution of potassium nitrate, but it was found that with the precipitate of potassium sulphate was a precipitate of *basic* ferric nitrate. This, on warming to expel the alcohol, became so basic as to be insoluble in water. The experiment was repeatedly varied, without full success.

The following process was then devised by calculation and experiment, and in repeated trials it made a satisfactory liquor, one fluidounce of which, in each instance, gave very nearly ten grains of dry ferric oxide:

Take of	solution of tersulphate of iron,	7 fluidounces
	water of ammonia,	8½ fluidounces
	nitric acid,	3 troyounces and 145 grains
	distilled water,	a sufficient quantity

To the water of ammonia, mixed with twelve fluidounces of water, add, stirring constantly, the solution of tersulphate of iron, previously mixed with twelve fluidounces of water. Filter and wash the precipitate until the washings render solution of chloride of barium only slightly turbid. Let the precipitate drain and dry till it can be removed from the filter without loss. To two troyounces and 250 grains of the nitric acid, mixed with an equal volume of distilled water, add, without heat and stirring constantly, the precipitate of ferric hydrate until it no longer dissolves. Filter the solution, and wash the filter with repeated small portions of distilled water, adding the washings to the filtrate. Then add to the solution the remainder of the nitric acid and (after it has attained a pale amber color) add enough distilled water to make the liquid measure 36 fluidounces.

One fluidounce of this solution should furnish 10 grains of dry ferric oxide.

II. *Comparison of four Processes for the Morphiometric Assay of Opium.* By JAMES LYNN, Ph.C.

Four samples of opium, obtained at different reputable pharmacies, were each assayed by the four processes. The opium was dried, to lose no more weight, at 100°C.

	PERCENTAGES OBTAINED.			
	No. 1.	No. 2.	No. 3.	No. 4
1. Procter's Staples' process,[1]	11·22	13·62	9·14	12 69
2. Mohr's process,[2]	11·40	13·48	9·30	12.77
3. Hager's Jacobson's process,[3]	11·68	13·86	9·46	12·98
4. Dragendorff's Mayer's process,[4]	12·33	14·00	10·40	13·06

Of the three *gravimetric methods*, Staples' gives much the purest and best crystallized morphia, being nearly colorless and readily detached and gathered. For this reason Staples' is preferred by the operator to Mohr's or Hager's method, unless time is an important object. Hager's is the quickest and simplest, being completed in four to six hours, while the product is about as pure as Mohr's; the crystals from both these methods being imperfect and colored. The yield is greater in Hager's than in Staples' process, but very likely the amount of absolute morphia is not much greater.

In any gravimetric method the morphia separates by crystallization slowly, and, we must suppose, approximately, and that a weighable

[1] "Proc. Am. Phar. Asso.," 1870, p. 129; "Am. Jour. Phar.," 1871, p. 65. (First method given by Procter.) The plan of the U. S. P. preparation of morphia.

[2] "Annal. der Chem. u. Phar.," B. 35, S. 120; "U. S. Dispensatory." Third method given by Procter, as above quoted.

[3] "Hager's Untersuchungen," II, 176; "Am. Jour. Phar.," 1871, p. 224. Founded on Mohr's.

[4] The Volumetric Method. Mayer, "Am. Jour. Phar.," 1863, p. 20; Dragendorff, "Werthbestimmung starkwirkender Droguen," p. 86. This method was employed as follows: Three grams dried powdered opium were exhausted with benzene, the adhering benzene fully evaporated, the dry powder macerated in water for 12 hours, then percolated on a filter with water until the water passed colorless. The dilute percolate acidulated with sulphuric acid, and the reagent added from the burette in portions so limited as to prevent excess, allowing the precipitate to subside after each addition. At intervals, a drop of the clear supernatant liquid is taken on a dark-colored glass slide, with a drop of reagent from the burette, this portion being rinsed into the tested solution each time until the addition is completed. Each c.c. of a solution of 13·546 grams mercuric chloride and 49·8 grams potassium iodide in water to one litre, precipitates 0·02 grams morphia.

proportion of morphia remains in the mother liquors of the gravimetric processes is strongly supported by the results of the volumetric method. Here weighable portions of the alkaloid do not escape determination, and no non-alkaloidal matter obtains determination. Other alkaloids, however, may be included, notwithstanding the use of benzene. Also, the *execution* of the volumetric process may suffer appreciable variations. At any rate, it must be held that the greatest exactness is *attainable* by the volumetric method.

III. *Valuation of Powdered Ipecacuanha Root and Dover's Powder, as found in the Market.* By T. M. STEWART, Ph.C.

All the specimens were obtained from different retail drug stores in Detroit and Jackson, Michigan.

The ipecacuanha was assayed by the process lately recommended by Dragendorff,[1] the drug being extracted first by acidulated water, and then by alcohol, the pectin filtered out from the concentrated solution, when the alkaloid is either determined volumetrically by potassium mercuric iodide or extracted by chloroform or benzene in presence of barium carbonate, and the residue thereof weighed. (One c.c. Mayer's solution precipitates 0·0189 gram emetia.)

Both volumetric and gravimetric ways were found to give concurring duplicate results, and the two ways gave results corresponding closely with each other; but the volumetric method leaves less danger of loss in operating. Two grams were taken each time.

POWDERED IPECACUANHA.

No. 1.	1·75	per cent.	emetia.	No. 5.	1·90	per cent.	emetia.
" 2.	1·45	"	"	" 6.	2·00	"	"
" 3.	2·10	"	"	" 7.	1·90	"	"
" 4.	1·60	"	"	" 8.	2·05	"	"

Average, 1·84 per cent. emetia.

All the numbers were examined microscopically and chemically for adulterations, especially for almond meal, chalk and antimonium potassium tartrate, but no adulterations were found, except a little extraneous woody fibre.

The compound powder of ipecacuanha was assayed as follows:[2] Three grams of the powder were extracted with 85 per cent. alcohol

[1] "Werthbestimmung einiger starkwirkender Droguen" (1874) S. 37.

[2] "Dragendorff's Werthbestimmung," S. 96.

(the residue tested for adulterations); the dry residue from the alcohol dissolved in acidulated (sulphuric acid) water, filtering if necessary, and the narcotina removed by washing the acid solution with ether. After addition of excess of barium carbonate, the solution is now extracted with benzene (several portions), the residue from evaporation of the benzene being weighed as emetia (confirming by dissolving in acid water and titrating with potassium mercuric iodide). The solution exhausted with benzene is washed with amylic alcohol (several portions), and the residue from evaporation of the amylic alcohol weighed as morphia (confirming volumetrically by potassium mercuric iodide after dissolving in acidulated water). The ether and the amylic alcohol should be water-washed.

DOVER'S POWDER.

No. 1,	0·20	per cent.	emetia,	and	1·03	per cent.	morphia.
" 2,	0·16	"	"	"	1·00	"	"
" 3,	0·23	"	"	"	1·06	"	"
" 4,	0·20	"	"	"	1·03	"	"
" 5,	0·13	"	"	"	0·93	"	"
" 6,	0·13	"	"	"	1·00	"	"
" 7,	0·26	"	"	"	1·06	"	"
" 8,	0·23	"	"	"	0·96	"	"
Average,	0·19	"	"	"	1·01	"	"
U. S. P. standard,					1·00	"	"

The average of 0·19 per cent. in Dover's Powder equals 1·90 per cent. emetia in ipecacuanha.

All the samples of Dover's Powder were examined for adulterations, organic and inorganic, but none were found.

CONTRIBUTIONS TOWARDS THE HISTORY OF SOME DRUGS.[1]

BY PROFESSOR FLÜCKIGER.

In writing our "Pharmacographia," my late friend Hanbury and myself have endeavored to trace the history of each substance as far back as possible, and to ascertain the date of the introduction into pharmacy of drugs—especially of those furnished by foreign countries.

[1] Abstracted from the author's "Documente zur Geschichte der Pharmacie." Halle, 1876, p. 96.

Many curious facts are connected with the way of their propagation throughout Europe, both in early and in the middle ages. As to England, I am entitled to suppose that there are existing but an extremely limited number of sources of valuable information about the subject under notice which had escaped the careful investigation of my lamented friend. As to the continent, there is in the library of the British Museum an interesting volume marked $\frac{777.c}{5}$ (Pharmacopœia), and entitled "*Valor sive taxatio omnium materierum medicarum . . . quae in officinâ pharmaceutica Swinphordianâ venundantur*," printed at Giessen, 1614. This is the tariff of drugs and compound medicines which were to be met with in the pharmaceutical shop of Schweinfurt on the Main, then one of the numerous free cities of the old German Empire. The establishment (Apotheke) was not a private business, but remained from A.D. 1412 until the year 1803 the property of the commonwealth of that imperial town, and was managed—under the superintendence of the physicians—by an apothecary appointed by the magistrate. The tariff was therefore settled by this authority. The same may be said with regard to many other German towns, a fact which, no doubt, depends upon a good deal of public interest already devoted in those early times to pharmaceutical matters. Thus the volume alluded to contains not only the "tax" of Schweinfurt, but also those of Bremen (1644), of Basel (1647), of Rostock (1659), of Quedlinburg (1665), and Frankfurt (1669). Daniel Hanbury at once appreciated the usefulness of these documents, which we subsequently made free use of, as may be seen from several pages of the "Pharmacographia" (77, 177, 234).

It was evident that similar medicine tariffs must have been in vigor throughout the numberless States, so very different in size; which were formerly termed the German Empire; and not only tariffs, but most of them had their own pharmacopœia and medico-pharmaceutical laws. Since my late friend first drew my attention to the said volume in the British Museum, I have succeeded in perusing—for the same purposes—somewhat more than one hundred of similar lists or tariffs of German towns, ranging from the year 1558 down to the middle of the last century. They are scattered in various public libraries throughout Germany, but I learn from A. N. von Scheerer's "Literatura Pharmacopœarum," Leipzig, 1822, p. 232, that there are about forty more of

the same periods which I have not yet been able to consult. No other country, as far as I know, can boast of such a number of similar documents, which I think must be considered as an evidence of a somewhat advanced state of the pharmacy in those ages, although the fact may partly be explained by the extreme, and we may say absurd, self-government then prevailing among the Germans. In 1872 at last the way has been cleared for ever by the "Pharmacopœa Germanica."

In abstracting the said tariffs, I have met with a good deal of information which may some day prove useful to any author engaged in the history of Pharmacy. I have therefore communicated my notes to the *Archiv der Pharmacie*, volumes 204 and 205 (1875 and 1876), from which they are reprinted under the title "Documente zur Geschichte der Pharmacie," Halle, 1876, 96 pages. A few pages from this pamphlet may be permitted to be quoted in this place in order to show that they afford even some further elucidation to questions which had been treated with a certain amount of care in the "Pharmacographia." The sources from which the following facts have been borrowed are pointed out in the pamphlet:

Balsamum Canadense is stated ("Pharmacographia," p. 553) to have been noticed in England A.D. 1761, but in my "Documente," p. 92, it is found to have been sold at Strassburg as early as 1759 as a current article of the pharmacy of that country.

Balsamum Copaivæ.—Its history is somewhat exhaustively traced out in "Pharmacographia," p. 201, and also (p. 184) that of a certain white American balsam, the latter being derived from several species of *Myroxylon* and *Myrocarpus*. It would appear from some tariffs abstracted in the "Documente," pp. 47, 52, 65, 68 and 69, that in some cases *Balsamum Americanum, s. Indicum, s. Mexicanum album* was probably intended for copaiba—for instance, in the private tariff of an apothecary of the city of Görlitz, of the year 1629. But in the Pharmacopœia of Amsterdam, A.D. 1636, *editio sexto, Balsam. Copæ. yvæ* is distinctly enumerated. The authors of the "Pharmacographia" had not been able to find it mentioned in English pharmacy previous to the year 1677.

Balsamum Peruvianum.—Perhaps *Balsamum Indicum*, of the tariffs of 1605 and 1607, quoted in the "Documente," pp. 35 and 36, may mean Peru balsam; it is, however, expressly termed *Balsamum Peruvianum* in the tax of Mainz (Mayence), A.D. 1609, and what is more curious,

the pods of the tree, *Fructus balsami indici*, are met with in the lists of Wittenberg in 1646, and of Nordhausen, 1657. These pods are still occasionly imported on account of the fragrant resinous contents of the large ducts around the seed. Their fragrance, which I am told is much appreciated by perfumers, is quite different from that of the balsam itself (see "Pharmacographia," p. 184). *Balsamum Indicum nigrum fluidum* is another name frequently applied to Peru balsam; *Balsamum Hispanicum* ("Documente," pp. 45 and 49) may rather mean balsam of tolu. It is hardly possible to say what was *Balsamum Americanum s. Indicum verum*, p. 41.

Balsamum hispanicum siccum seu americanum resinosum in the tariff of Schweinfurt, 4th edition, 1644 ("Documente," p. 49), as well as *Balsamum Indicum durum* of Ulm, 1648 ("Documente," p. 53), cannot be doubted to mean balsam of tolu. The product of *Myroxylon Pereiræ*, which is exclusively prepared on the balsam coast of San Salvador, having been formerly carried to Callao, the chief port of Peru during the Spanish dominion, the name of Peru balsam was given to it. This may account for the appellation of *Balsamum hispanicum*, which appears to have been bestowed upon the balsam of tolu, inasmuch as it used to be immediately shipped for Spain—as it is still—from the ports of New Granada.

The earliest express mention of Balsam*us* tolutan*um*, I have met with in pharmaceutical tariffs occurs in that of the city of Frankfurt of 1669, quoted in the "Documente," p. 65. From what we stated in the "Pharmacographia," p. 177, it is probable that the drug was then likewise used in England, but there is no proof of the fact as far as I can see; I would be glad, however, to be corrected in this opinion.

Benzoin began to be introduced as a commercial article in the beginning of the sixteenth century ("Pharmacographia," p. 362). It was abundantly obtainable in the middle of that century, for Hieronymus Cardanus states in his work, "De la Subtilité," French translation, 1556, p. 160, that "belzoi est de vile prix pour l'abondance." Benzoin, according to the custom of that period, was then submitted to destructive distillation, by which it yielded benzoic acid, which was first noticed by the famous French astrologer, Michel de Nostredame,[1] about the year 1556. This preparation appears to have quickly come

[1] "Excellent et moult utile Opuscule à touts necessaire qui desirent avoir cognoissance de plusieurs exquises receptes." 1556.

into more general use; it occurs in the list of Görlitz (east of Dresden) of 1629, under the name of *Benzoi flores*.

Arnotto, the pulp of the fruit of *Bixa Orellana*, the well known dye, occurs in tariffs of Wittenberg, 1646, Budissin, 1660, Leipzig, 1669, under the name of Orlian, which it still bears in German.

Cascarilla bark.—The Bahamas having been in the possession of the English from 1629 to 1641, the authors of the "Pharmacographia" supposed it to have been first introduced in Europe by way of England, but no evidence at all has been found to prove the correctness of this suggestion. The said islands were occupied in 1641 by the Spaniards, and to them apparently is due the introduction of this bark. It bears a certain resemblance to quills of cinchona barks, and was, therefore, first noticed by the name of *China nova*, or cascarilla, which designations were, no doubt, of Spanish origin. It is said, however ("Documente," p. 76), that it had first been mentioned in the pamphlet—"De machinis fumiductoriis," Hamburg, 1686, by J. A. Stisser, Professor in the University of Helmstedt, near Brunswick. I have not seen this pamphlet, nor that of V. G. Salat, of Valencia, Spain—"Unica quaestiuncula, in qua examinatur pulvis de Buarango vulgo *Cascarilla* in curatione tertianæ." Valentiæ, 1692. Both these pamphlets appear to be extremely rare, the first being not even quoted in Haller's "Bibl. Botanica." But in the list of Minden, 1691 ("Documente," p. 74,) I have found *China nova*, together with China de China—*i. e.*, true Cinchona. There can be no doubt that this refers to cascarilla, for in another tariff of 1694 ("Documente," p. 74), published at Gotha, Cortex *Chinæ noevæ seu Schacorillae* is quoted as well as in several other lists abstracted in the "Documente."

Catechu is said in the "Pharmacographia" to have been unknown in Europe until the latter half of the seventeenth century; yet in the tariff of Wittenburg of 1646, *Catechu seu terra Japponica* is met with. It again occurs in several other tariffs of the same century, and is always quoted at very high prices. In 1666, at Magdeburg, catechu was much more costly than benzoin, balsam of Peru, camphor, opium, mastix, etc. ("Documente," p. 64). Even in 1780 the wholesale price in London was £20 per cwt.; to-day the commodity fetches about 18*s*.

The earliest mention of Cinchona bark—*China Chinæ*—is found in the tariffs of Leipzig and Frankfurt of the year 1669. In England it had begun to be known about 1655.

One of the most curious things is the occurrence of coals, *carbones petræ*, among the drugs of the tariff of the city of Freiberg, in Saxony, A.D. 1680.

Cacao seeds and chocolate were to be found with German pharmaceutists as early as 1656 and 1683 ("Documente," pp. 53 and 69), and *Coffee*—"Bon Coffi Grana"—in 1683 in the pharmaceutical office of the court of Dresden. It is much more striking to learn from the tariff of the city of Nordhausen, near Göttingen, that in 1657—*Herba theæ*—was there a pharmaceutical article. It also occurs in the tariff of Liegnitz, in Silesia, in 1662, under its Chinese name, *Herba shak*; it then commanded a most extraordinary price, namely, fifteen florins a handful.

Gamboge.—I have afforded some new information about the history of that drug, as may be seen in the "Documente," pp. 41, 43, 44, 46, 48, etc. In the list of Frankfurt, of 1612, *Gutta gemou* (gamboge) is stated to be a purging dried juice, coming from the kingdom of Patana in India. The meaning of *Gutta gemou* is explained in the "Pharmacographia," p. 77. Patana is a country and a port on the eastern coast of the peninsula of Malacca, where the Dutch established a settlement in 1602, and were followed there in 1612 by the English. Gamboge may have been imported there from the countries on the opposite shore of Cambodja, where it is still colleted.[1] Its early introduction in Europe is, no doubt, due to the Dutch. In the tariff of Copenhagen of 1619, and in many tariffs of German towns down to the eighteenth century, gamboge is also termed Gummi de Peru, which is, no doubt, simply a corruption of the Javanese word gemou, or jamu—*i. e.*, a medicine ("Pharmacographia," p. 77, note 4).

Iris Florentina.—As may be seen even in the "Divina Commedia," cant. xvi, the ancient arms of Florence were a white iris on a red shield, which were subsequently altered, the red iris or lily (*giaggiolo*) now being on a white shield. This probably indicates an early cultivation of orris root near Florence. In the early ages, that of Illyria was held to be the best ("Pharmacographia," p. 599), and was still quoted in many of the German lists under notice. In that of Schweinfurt, in 1614, *Radix Iridis Florentinæ*, however, is the only one mentioned.

Liquorice.—A list published in 1582 at Frankfurt informs us that they had then Russian and Spanish liquorice and inspissated liquorice

[1] See *Pharm. Journ.*, iv. (1874), p. 803.

juice from Candia. In many other tariffs—for instance, in that of Worms, 1609, and in that of Copenhagen, 1619—liquorice of Bamberg in Bavaria is quoted, and in Conrad Gesner's interesting work, "De Hortis Germaniæ," Strassburg, 1561, p. 164, the author says already that near Bamberg of liquorice there was "*maximus eius proventus.*"

Manna of Briançon, from *Pinus larix*, "Pharmacographia," p. 373, would appear ("Documente," pp. 18 and 30) not to have been so very rare an article in the second half of the sixteenth century as it is now-a-days.

Mastiche.—From the very exhaustive information on the history of mastiche alluded to in the "Pharmacographia," I was led to suppose that resin to have always exclusively been produced in the island of Scio (Chios), but there is evidence ("Documente," pp. 31, 41 and 65) that it was also collected in the island of Cyprus.

Mucunae setæ—cowhage.—The pods and hairs of *Mucuna pruriens* were not much used in England before 1769 ("Pharmacographia," p. 166); they appear, however, to have been employed as early as 1714 in Germany, inasmuch as they are contained in the list of Onolzbach, near Nürnberg ("Documente," p. 84).

Among essential oils that of *bergamot* is well worth noticing in the "Catalogus omnium medicamentorum . . . in officina pharmaceutica á J. C. Scipione . . . " This is the private list of a druggist of Giessen, 1688. There are several lists recorded in my "Documente" which had been published in the seventeenth century by German pharmacists in order to show what stores they offered for sale; no doubt this was the case with only the most considerable pharmaceutical establishments of the time. The earliest notice of oil of bergamot pointed out in the "Pharmacographia," p. 109, referred to the year 1693, when it was mentioned in "Le Parfumeur François." The "Documente" now trace it a few years further back.

Oleum cajuputi was to be met in the little town of Hof, east of Coburg, as early as 1726, a fact which also is no longer in full accordance with the statements of the "Pharmacographia."

Oleum Matricariæ Chamomillæ.—This oil, which is so extremely remarkable on account of its intensely blue tint, had apparently never been appreciated in England. In Germany it was prepared in 1588

by Joachim Camerarius; and was to be found in 1608 in the "Apotheke" of the city of Schweinfurt.

One of the most costly oils used to be that of cinnamon; it was even quoted at a higher rate than otto of rose. The latter was a regular article of pharmacy in Germany as far back as the year 1607, when it was enumerated in the list of Freiburg.

The oils of sassafras and of cochlearia were sold at Dresden in 1683. Crystallized oil of sassafras appears to have been first obtained by John Maud, F.R.S., in 1738. He stated the crystals to be as long as four inches; I have prepared colorless crystals exceeding that length and more than one inch in diameter.

Piper æthiopicum, or *Piper nigrorum*, one of the substitutes for pepper, occurs in the lists of Wittenberg, 1646, Nordhausen, 1657, Magdeburg, 1666. This spice consisted of the fruit bunches of a tree of the order *Anonaceæ*, indigenous throughout Western tropical Africa—viz., *Xylopia æthiopica*, Richard (*Syn. Habzelia æth.*, D. C.; *Unona*, Duval; *Uvaria*, Guill. et Perrott.). It is figured in Matthiolus "Commentar. in sex libr. Diosc.," Venetiis, 1570, fol. 400; also in Guibourt's "Hist. nat. des Drogues simples," III (1869), p. 736, and described in Lindley's "Flora Medica," p. 27, as well as in Oliver's "Flora of Tropical Africa," I (1868), p. 30. Nothing whatever is known about the chemical constituents of this fruit, which is now entirely out of use.

Saffron.—English saffron has been so abundantly exported in the seventeenth century that it is found in the tariff of Copenhagen in 1619, and is even termed in that of Celle, in Hanover, 1682, *Crocus communis Anglicus*. This agrees well with our statements in the "Pharmacographia," p. 603.

Sarsaparilla was known in England about the year 1568; it appears to have been sold in Frankfurt in 1582.

Sassafras was sent to England in the beginning of the seventeenth century, as may be supposed from the facts recorded in the "Pharmacographia," p. 483. The drug was well known at Frankfurt in 1582, and at Hamburg in 1587, when it was termed *Lignum pavamum*, *s. floridum*, *s. xylomarathri* (fennel-wood).

Serpentary root of Virginia is met with in 1697 ("Documente," p. 77); in England it was in regular use at least since the year 1650.

Sugar.—Some interesting contributions to its history may be derived from the "Documente," p. 32. There were in the sixteenth and seventeenth centuries many sorts and kinds of sugar illustrating the migration of the sugar cane from India to the new world. Thus, Saccharum *candum*, or also sometimes, *Sal indum*, is sugar of Indian origin; Saccharum *tabarzeth* means in Persian a very hard crystallized sugar; Saccharum *Melitense* alludes to Malta; whereas, strange enough, neither Egyptian nor Sicilian sugar is ever mentioned in the tariffs. From the Mediterranean the plant was introduced into the Atlantic islands—hence Saccharum *Madeirense*, *Canariense*, and at last sugar from the island of San Tome, in the Gulf of Guinea, Saccharum *Thomasinum*. In this place the sweet cane had been transplanted by the Portuguese about the year 1500, but in a later period they stopped its cultivation in the island in favor of its introduction into Brazil. All these various kinds of sugar are mentioned in the German lists under examination; and besides them there is frequently to be met with *Saccharum penidium*, or *Saccharum turbinatum*, the preparations now known under the names of boiled or pulled sugar, the amorphous barley sugar of the confectioners.

Zinc seu Spiautr is an article of the tariff of Copenhagen of 1672; in a German list of 1682 it is distinguished as *Marchasita pallida v. Zinck* from *Marchasita officinarum*, *plumbum cinereum*—*i. e.*, bismut.

The "Documente," if I am correct, afford a very curious illustration of the state of pharmacy, especially in Germany, during the sixteenth and seventeenth centuries, as the above abstracts from my pamphlet may prove. They, at the same time, furnish many little contributions to the history of drugs, and are the more remarkable as similar documents—at least, in so great a number and variety—seem not to exist in any other country than in Germany, and perhaps a few other countries where the German idiom is spoken. I thought them well deserving of a somewhat minute investigation, inasmuch as they must be considered as a real picture of ancient times, full of actuality. —*Phar. Jour. and Trans.*, 1876. June 24.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

III.

In addition to the notes on the cinchonas and their products, published in our last number, the exhibit of Evans, Lescher & Evans, of Liverpool, England, deserves to be mentioned for the specimens of South American red bark and of the East Indian barks of Cinchona lancifolia and C. succirubra in connection with fluid extracts, and some salts of cinchona alkaloids. Cinchona barks are also found in the department of Venezuela, in the Agricultural Building; the kinds shown are those known by the local names of *carayaca* and *barquisimeto*, the botanical origin of which we have not ascertained, and the bark of *Cinch. cordifolia var. rotundifolia*, Weddell. This tree is indigenous to New Grenada, attains a height of 23 to 26 feet and grows at an elevation of 5,000 to 8,000 feet (1,500 to 2,400 metres) above the sea. Several varieties of this species are found further South in Peru; the variety rotundifolia was discovered not far from Caracas by Dr. Ernst, in 1870, after it had been collected by Dr. Vargas, in the same place, in 1829 (see "Am. Jour. Pharm.," 1870, p. 449). Delondre and Bouchardat obtained from this bark 1·2 to 1·4 per cent. of quinia sulphate containing some quinidia, and ·5 to ·6 per cent. of cinchonia sulphate. Marcano found much less in the bark from Caracas, probably in consequence of improper collection.

The mother liquors finally obtained in the manufacture of the cinchona alkaloids contain the uncrystallizable chinoidin, which is also found in our commerce under the names of amorphous quinia and precipitated extract of bark. Notwithstanding it has been repeatedly and urgently recommended as a reliable tonic and efficient febrifuge, it is comparatively little employed in regular practice, a neglect which, in our opinion, is not at all deserved, but may, perhaps, be traced to its unsightly resinous appearance and its difficult manageableness, owing to its insolubility in water. These objections are entirely removed by a compound exhibited by Fr. Jobst, namely, the *citrate of chinoidin*, in the form of transparent scales, resembling the scale preparations of iron. In this combination chinoidin may be readily given in any desired form, and, therefore, as conveniently prescribed as any salt of the more costly cinchona alkaloids. We think that pharmacists should direct the attention of physicians to this new and handsome preparation.

Another febrifuge drug which has attracted some attention since the Vienna International Exposition is *dita bark*, the bark of *Echites scholaris* Lin., s. *Alstonia scholaris*, R. Br., which is exhibited by Jac. Zobel, apothecary at Manilla, under the names of *Corteza de dita* or *quina Filipina*. Gruppe had prepared from it an amorphous alkaloid called *ditaina* ("Am. Jour. Pharm., 1873, p. 316), which was found to possess several advantages, even over quinia in the treatment of fevers. This ditaina is evidently not a pure alkaloid, and the peculiar proximate principles of dita bark are more numerous ("Am. Jour. Pharm.," 1875 p. 221) than was at first supposed. Jobst and Hesse obtained from the alcoholic tincture, by precipitating it with sugar of lead, a crystalline and an oily acid; by precipitating afterwards with subacetate of lead, different resin-like products, and subsequently, by

acidulating and treating with phospho-tungstic acid, an alkaloid (·02 per cent. of the bark) called *ditamina*, which yields crystallizable and very bitter salts. By treating the bark directly with petroleum benzin, several principles were obtained, of which *echicautchin*, *echicerin* and *echiretin* appear to be compounds of O_2 with respectively 5, 6 and 7 molecules of C_5H_8, while *echitin* was found to have the composition $C_{22}H_{52}O_2$, *echitein* being $C_{42}H_{70}O_2$. The last named two principles, handsomely crystallized, are exhibited by Fr. Jobst, together with echicerin. Jobst and Hesse, however, are of the opinion that the febrifuge properties of dita bark, if really as powerful and reliable as has been asserted, can hardly be due solely to the minute quantity of alkaloid contained in it, and that, therefore, the bark promises to be of little importance as the source of well characterized alkaloidal salts ("Ann. Chem. u. Phar.," vol. 178).

It may not be uninteresting to mention, in this connection, that several other species of *Echites* are medicinally employed in the East Indies, as *Ech. malabarica*, Lam., the root of which is used as a febrifuge and the leaves as an application to carbuncles; *Ech. caryophyllata*, Roxb., the leaves used in arthritic fevers; *Ech. pubescens*, Buch. and *Ech. antidysenterica*, Roxb., the bark used as a remedy for diarrhœa and dysentery. Several Brazilian species, like *Ech. Cururu*, Mart., *Ech. insignis*, Spr. and *Ech. longiflora*, Desf., are used there for similar affections of the bowels, and *Ech. syphilitica* Lin. fil., indigenous to Surinam, is employed there in syphilitic complaints. It is not unlikely that all species of this genus, perhaps all the plants of the natural order Apocynaceæ, possess valuable medicinal properties to a greater or less degree.

By far greater importance must be attributed to a native tree of Australia, Eucalyptus globulus, which, during the last six or eight years, has attracted a great deal of attention in various parts of the world, on account of its reputed anti-malarial and febrifuge properties (see "Am. Jour. Pharm.," 1869, p. 300; 1872, pp. 219, 540, 564; 1873, pp. 233, 281; 1874, p. 41; 1875, p. 423; 1876, pp. 23, 329). It is now extensively cultivated in Southern Europe and Northern Africa, throughout a large part of the basin of the Mediterranean, nearly all the States of that section having sent the leaves and volatile oil to the exposition; some also other pharmaceutical preparations, like distilled water and spirit, tincture, wine, extract, resin, &c. The Orange Free State of Southern Africa sends a section of wood, and from American countries Eucalyptus leaves are exhibited by Brazil, Mexico, Jamaica and the United States. In Jamaica, where the plant has been introduced in 1870 and raised from seed, has attained a height of fifty feet in five years; it is at present grown at an elevation of 5,000 feet above the sea, and the fresh leaves have yielded the same amount of volatile oil as in Australia, about ·75 per cent., some of which is exhibited by Mr. Rob. Thomson, also some wood, the tree being regarded as very valuable for timber. During the last two years the tree has become popular in a few localities of South Carolina, and more recently it has been planted in North Carolina, promising well in both localities. To study the various species of Eucalyptus, however, more particularly in relation to their wood and natural exudations, no portion of the exposition offers better opportunities than the native country of these myrtles, Australia.

The province of Queensland exhibits several large collections of its valuable

timber, in the form of logs and slabs, partly polished so as to show their grain to better advantage, and among them are not less than thirty distinct species of myrtles, belonging to Myrtus, Melaleuca, Eugenia, Eucalyptus and other genera. Similar exhibits are made by Tasmania, Victoria and other Australian colonies, and altogether we have noticed timber from over thirty different species of Eucalyptus, the wood of which varies between a light yellow or brown, some varieties having a distinct green tint, to a dark brown, red-brown or brownish red, the alburnum being in all cases of a lighter color, and the duramen, or heart wood, frequently veined or of a marbled appearance. The vernacular names of blood-wood (*Euc. corymbosa*, Sm.), mahogany (*Euc. marginata* and *resinifera*, Smith), yellow box (*Euc. hemiphloia*, Muell., and *melliodora*, Cunn.), and others have reference to the color of the wood; the name *mahogany* is, however, given in Australia to several other myrtles, and probably to trees of other natural orders having red-colored wood. The green timber of the Eucalypts is stated to be generally soft, and to acquire its hardness on drying, many varieties becoming then difficult to work.

It is, however, not the value of these woods for the builder or cabinet maker that gives to them their medicinal and pharmaceutical importance, but rather the so-called gums and the volatile oils which the various species yield, some in very large quantities. The so-called Botany bay kino is the product obtained by inspissating the red exudation of *Euc. resinifera*, Sm.; but similar products are obtained from other species, like *Euc. corymbosa*, Sm., *E. maculata*, Hook., *E. rostrata*, Schlech., *E. hemiphloia*, Muel., *E. siderophloia*, Benth. and others, and are exhibited in the colonial departments of Australia. The "gum" of the last named species is shown in irregular lumps, and likewise in thin transparent garnet-red scales, resembling the scale preparations of iron. The majority of these products appear to be closely allied to the pterocarpus kino; according to Wiesner ("Zeitschr. Oest. Apoth. Ver.," 1871), who examined the exudation from 16 eucalypts obtained from Dr. Moore, director of the Botanical Garden at Sidney, they contain kinotannic, and small quantities of catechuic and pyrocatechuic acids, but are free from pectin compounds. Some of these varieties were entirely free from gum, while others were found to contain small, and a few large quantities of gum; the latter is particularly the case with the "gum" from *Euc. gigantea*, Hook., which is almost completely insoluble in alcohol.

The separation of a saccharine substance upon the leaves and tender twigs of some eucalypts has been noticed some years ago ("Am. Jour. Pharm," 1862, p. 546). This Australian *manna* appears to be of two kinds, that which is exuded by *Euc. viminalis*, Labill., as is supposed in consequence of the punctures of insects, and the kind called *lerp*, which is regarded as the secretion of an insect of the Psylla family upon the leaves of the mallee scrub, the *Euc. dumosa*, Cunn. Both kinds appear not to contain any mannit.

The importance of the eucalypts as sources for an almost unlimited supply of volatile oils of various kinds, has been noticed on former occasions ("Am. Jour. Pharm.," 1863, p. 451), and, we believe, first attracted attention through the observations of Baron F. von Mueller, director of the Botanical Garden at Melbourne,

to whom, likewise, the credit is due of having proven the very rapid development, even on dry snd exposed spots, of *Euc. globulus*, Labill., *Euc. obliqua*, L'Herit,, and other Australian trees ("Am. Jour. Pharm.," 1868, p. 51), upon which quality the malaria-destroying properties of the blue gum tree (Euc. globulus) appear to depend. It is, however, not unlikely that the presence of a large proportion of volatile oil may be quite an important factor in this respect.

Volatile oils are found in all the eucalypts, whether they merely attain the moderate size of shrubs, like the mallee scrub (*Euc. dumosa*, Cunn., *E. oleosa* and *socialis*, Muel.), or rise as towering giants to the height of 400 or 500 feet, like the *Euc. colossea*, Muel., and *Euc. amygdalina*, Labill. The vast amount of volatile oil produced by the Australian eucalypts has been well set forth in a paper read by Mr. Jos. Bosisto, President of the Pharmaceutical Society of Victoria, before the Royal Society of Victoria, August 10, 1874, from which we make the following abstract:

The eucalypts agree in this, that they cast their bark; that the leaves are evergreen and have translucent oil cells; that the petiole is half twisted and the plane of the leaf parallel to the axis of the tree; that the roots are dispersive and drain water largely from the soil, and that they contain tannin (tannate gum resin), volatile acid and volatile oil. Most parts of the tree contain the two first mentioned principles, but the oil is found only in the leaves. Regarding the quantity of the volatile oil yielded by the eucalypts, the following 8 out of 130 species enumerated by Baron Mueller are regarded as representative, and 1,000 lbs. of their fresh leaves (attached to very small branches) yield the quantities of volatile oil stated below:

1 Euc. odorata, Behr, or peppermint tree,	yield	7	fluidounces	volatile oil.
2 Euc. viminalis, Labill., or manna gum,	"	7	"	"
3 Euc. rostrata, Schlech., or red gum,	"	15	"	"
4 Euc. obliqua, L'Her., or stringy bark,	"	80	"	"
5 Euc. globulus, Labill., or blue gum,	"	120	"	"
6 Euc. sideroxylon, Bent., or iron bark,	"	160	"	"
7 Euc. oleosa, Muel., or mallee,	"	200	"	"
8 Euc. amygdalina, Labill., or peppermint tree,	"	500	"	"

The range of the species represented by the first two is limited, while the others have a wide range. The supply of oil varies, the variation, however, does not arise from any diminution of leaves, nor does it follow in a cycle of time from maximum to mimimum, but it is intermittent. The full causes of these peculiarities are not known; but some are pointed out as follows:

Euc. amygdalina, which varies in size from that of an ordinary willow to over 350 feet in height, occupies chiefly the higher portions of undulating forest lands and the sides of the ranges, and does not extend over 100 miles inland; the ground where it grows retains a little moisture throughout the summer months, September to April, the roots run chiefly lateral and are seldom lower than three feet from the surface; they are surrounded with a soil evenly cool, but the temperature of the air has its usual summer range, and during these months the supply of oil from week to week is very even; but as the cooler or winter months approach, the

ground becoming moist from rain, and the temperature of the air lower, the supply of oil falls off.

The mallee scrub is the opposite of all this. These dwarfs of the eucalypts seldom grow higher than 25 feet, and occupy a flat, dry, hungry country, with but little growth of grass under them, chiefly dwarf heath bushes. There is little rain, but when it comes it is generally in torrents; the soil is a reddish sand, in combination with salt clay; this, during the long droughts, becomes exceedingly hard, so much so that a pickaxe is required to turn the soil. The rootlets run somewhat in a horizontal direction, but the rootlets spread traveling downward; and, as the salt water is to be obtained always at from 25 to 40 feet, they are found resting on the moisture of the salt soil, just above the sandstone rock, which generally commences about 12 feet above the salt spring. The temperature of the surface ground, and also that of the air, is very high throughout the summer. The leaves supply a greater amount of oil during the winter or rainy months than during the hot summer months.

These circumstances depend partly upon the development of new leaves, which in the desert species commences in summer (December and January), but in the *amygdalina*, *globulus* and others in winter (July and August). Moreover, the vigor of the eucalypts is greater in some years than others, and when little new growth takes place the oil-cells are charged more equally throughout the whole year.

To illustrate further: In July, 1872, the ground being well saturated with moisture, the mallee was in fine oil condition, each two tons of rough-cut branches with their leaves gave two (Imperial) gallons of oil. The dry season set in immediately after, the temperature of the air rose rapidly to summer heat, ranging between 68 and 92° F., and in November the country was greatly parched and the only water obtainable was from the river Murray. The yield of oil decreased in November to 14 pints, in the beginning of December to 12, by the end of the year to 9 pints, and by the end of summer (March) fluctuated between 8 and 4 pints. During the same winter (July), the *amygdalina* yielded only one-fifth of its full summer supply. The variations during the two preceding years were similar, but not as rapid, while in 1861 the mallee yielded as much volatile oil in December as in July 1872, and the coast species kept up a good supply, with little change, throughout the whole year.

The volatile acid is contained more abundantly in those eucalypts which yield medium quantities of oil than in those yielding oils either largely or sparingly. In like manner this applies to the resin bodies. In the *amygdalina*, when the gum-resin begins to form and exude, the oil in the leaves is diminished. When the *globulus* is extra resiniferous, the acid is abundant and the oil small in quantity. The *rostrata* produces little oil, but the volatile acid is very abundant, so that the red gum wood owes its aroma entirely to this acid. The *sideroxylon* supplies oil abundantly, but the leaf surface is small in comparison with other species, and the enormous bark is everywhere studded with gum resin.

All these characteristics point to the conclusion that the volitile oil is the base of the other eucalyptic products.

The amount of oil produced by the eucalypts of Victoria and contained in their leaves is estimated as follows:

	Area.	Average yield of one gallon of oil for every	Total yield of volatile oil.
Dense mallee scrub,	5,560,000 acres.	50 square ft.	4,843,872,000 gallons.
Mountainous ranges, densely wooded with gums,	6,225,000 "	1000 "	271,161,000 "
Open timbered country,	38,922,000 "	4 acres.	9,730,000 "

Estimating the extent of the Mallee country in New South Wales and South Australia at twenty times the area given above, there are 96,877,444,000 galls. of oil held at one and the same time in a belt of country massed together, over which the hot winds pass; and considering that the same condition exists throughout the major part of Australia with the other eucalypts, we cannot arrive at any other conclusion than that the whole atmosphere of Australia is more or less affected by the perpetual exhalation of these volatile bodies and the generation of ozone by the minutely divided volatile oil.

All the physical and chemical characters of the eucalypts, enumerated above, lead to the conclusion that they are fever-destroying trees.

An interesting collection of eucalyptus products, which, after the close of the exhibition, will be presented to the Philadelphia College of Pharmacy, together with the other products sent here by Mr. Bosisto, comprise, besides a number of essential oils, also some pharmaceutical and technical products. The essential oils are those of blue gum (*E. globulus*), peppermint gum (*E. amygdalina*), mallee scrub (*E. oleosa*), red gum (*E. rostrata*), ironbark gum (*E. sideroxylon*), peach gum (*E. persicifolia*), sweet-scented gum of Queensland (*E. citriodora*), messmate gum (*E. fissilis*), apple tree gum (*E. stuartiana*), and white gum (*E. goniocalyx*). They vary considerably in their odor, which is for some, indicated by the vernacular names. Thus the oils of the various peppermint gums have an odor reminding of mint, the peach gum oil, one reminding of bitter almond, etc.

The blue gum is named from the shade of its foliage. The volatile oil is regarded as tonic, stimulant, antiseptic and anthelmintic; a small dose promotes the appetite, a large one destroys it. In doses of 10 to 20 minims it first accelerates the pulse and produces pleasant general excitement, shown by irresistible desire for moving about, and a feeling of buoyancy and strength. It is intoxicating in very large doses, not followed by torpor, but producing a general calmness and soothing sleep; any unpleasantness arising from an overdose will be removed by a cup of strong coffee. Internally it is given in doses of 3 to 5 minims in mucilage, syrup or glycerin, and as an anthelmintic by enema in quantities of 30 to 60 minims in mucilage of starch. The portion of the volatile oil called *eucalyptol*, ("Amer. Jour. Phar." 1870, p. 465), which, according to Faust and Homeyer, (*Ibid.* 1875, p. 65), is a mixture of four different compounds, is employed for inhalation in bronchial and throat affections, one-half to one teaspoonful being added to half a pint of water in the inhaler.

The powdered leaves of *Euc. globulus* are employed as an antiseptic cataplasm, and the tincture and a liquor as general tonics in doses of 20 to 30 minims, and as antiperiodics in double this quantity; cigarettes made of the leaves have been recommended in bronchial and asthmatic affections.

The oil of *Euc. amygdalina* is used externally in rheumatic complaints, and in perfumery, for soaps, etc. Dr. Day, of Geelong, recommends as an exeellent and very agreeable disinfectant, deal saw-dust mixed in the proportion of one bushel with about one to four ounces of the volatile oil; after keeping the mixture for four months, he found it to contain a much larger quantity of peroxide of hydrogen, than it did when first made, and that it continued to accumulate.

The oil of *Euc. oleosa* is chiefly employed in the manufacture of varnishes, which are said to be much superior than if oil of turpentine be used; the oil dissolves India rubber without requiring the application of heat.

The "red gum" of *Euc. rostrata* is stated by Mr. Bosisto to be a delicate mucilagenous astringent, more effective than catechu in all cases of dysentery, diarrhœa and throat affections. The sample examined by Wiesner (see above) was readily soluble in water and alcohol, free from gum, and had a neutral reaction.

Pharmaceutical preparations of *Euc. globulus* are also exhibited from Egypt, France and other countries, and if the importance is considered which this species has attained in many localities within a comparatively short period, it seems that experiments should be made with it in all sections of the United States which are free from severe frosts, and that these experiments should not be confined to that single species, but should also be extended to others which are equally rapid growers or produce the same or larger quantities of volatile oils.

ANILIN COLORS.

BY CARL RUMPFF.[1]

By dry distillation (without access of air) of coal, two accessory products are principally formed—coke and tar. The ammonical waters which are obtained have recently been largely used for the manufacturing of ammonia and its different salts. Coal tar forms the starting point for all the anilin colors, and also for alizarin. By heating it in cast-iron retorts up to a temperature of 180°C., there result successively *benzol*, *toluol*, *cumol* and *xylol*. The two last, as likewise a few other hydrocarbons, afford only a scientific interest. By nitrifying, *i. e.*, treating the two first-named fluids with strong nitric acid at a low temperature, *nitro-benzol*, best adapted for red or for blue anilin, and *nitro-toluol*, are produced. By employing more acid at a higher temperature binitro-benzol and binitro-toluol are formed. The conveying of these nitro-compounds into the amido-compounds, viz., *anilin oil for red anilin*, *anilin oil for blue anilin*, and *toluidin*, is effected by agitating them for a time with acetic acid and iron borings, in the proportion of about equal weights, and then separating, through distillation, the anilin or toluidin from the excess of iron borings.

According to a report delivered by Koechlin to the Parisian Academy, the honor of the discovery of anilin red, or fuchsin, is due to Prof. A. W. Hofmann, formerly

[1] This paper gives a succinct amount of the manufacture of anilin and allied colors from coal tar, and is condensed from a pamphlet issued by Fr. Bayer & Co., of Barmen and Elberfeld, in explanation of their interesting collection of crude materials and the products obtained therefrom, which are now on exhibition in Fairmount Park. Another paper on "Alizarin" will follow in our next number.—EDITOR *Am. Jour. Phar.*

of London, now at Berlin, who, in 1857, first described the effect of tetrachloride of carbon on anilin. By continued experiments, other chemists succeeded in perfecting this process (which was not adapted for gaining large quantities of this coloring matter), by finding in place of chloride of carbon the proto- and per-nitrate of mercury, and finally the most advantageous substitute—arsenic acid.

Prof. Hofmann, by farther investigations, discovered that chemically pure anilin as well as chemically pure toluidin do not produce any red dye in a workable manner, but that, very peculiarly, a mixture of both does. The proper proportion of the mixture, 1 part of anilin to 2 parts of toluidin, is sought to be attained as near as possible in the technical process for manufacturing the fuchsin. The first who obtained a patent for the production of anilin red with arsenic acid was Metlok, an English chemist. The best and most practical method is the following:

A mixture of anilin oil for red and arsenic acid, diluted with water, is heated in a distilling apparatus from 10 to 12 hours at a temperature of 180° to 190°C. The fused mass obtained in this way is broken into small pieces, boiled out with water the undecomposed arsenic acid as well as the arsenious acid which is formed is neutralized with chalk, and immediately after the color is dissolved the liquor is filtered through felt into the crystallization vessels. After three or four days cooling, the crystallization of the fuchsin has taken place, and the mother liquor is let off. The crystals, dried and freed from all dust and all the small crystals, represent *diamond fuchsin large crystals*, the smaller crystals passed through a sieve *diamond fuchsin small crystals*, and the uncrystallized part at the bottom of the crystallization tub is called *fuchsin red* (*ordinary*).

The basis of this peculiar dye, produced as above, Prof. Hofmann has called *roseanilin* (rosein base), a name now generally adopted. The combination of this base with any acid furnishes a number of salts; for instance, with acetic acid *acetate of roseanilin*. The oxalate, sulphate and nitrate of roseanilin are of little importance for dyeing. For the production of the pure base, the common acetate of roseanilin is used with the most advantage. The boiling solution, by adding an excess of ammonia, furnishes a crystalline sediment of a red color, which represents the base in a tolerable pure state.

About the year 1856, Perkins, in England, being occupied with experiments to produce quinia artificially, accidentally discovered a violet color, which, having been improved by several chemists, was for a long time known in the market under the name of Perkins' Violet, Anilin purple, Phenamin, Indisin, etc.

After red and violet had thus been discovered and practically employed, endeavors were generally made for producing an anilin blue, to which exertions and experiments the different violets as, *violet reddish*, *violet medium shade* (Pensée) and *violet blueish* (Parme), all three soluble in alcohol, owe their origin, as the following method shows:

By heating a mixture of fuchsin and anilin oil (an addition of acetate of soda facilitates the reaction) five to eight hours at a temperature of 150° to 160°C., the red color of the compound is gradually changed into violet. According to the desired shade, the fused mass is treated with acidulated water, the residue filtered and dried, and so the above blueish-violets are obtained.

The case is different with regard to blue. If 1 part of fuchsin, 3 to 4 parts of anilin oil and 1 part of acetate of soda are heated as above, the blue color is formed. By this process three equivalents of phenyl are taken up by the fuchsin, forming triphenyl-roseanilin and ammonia, which is given off. Of course, only the pure anilin is used. The fused mass treated with concentrated muriatic acid, and afterwards, according to the more greenish or reddish shade which is wanted, with alcohol, furnishes the *blue colors soluble in alcohol*, namely, blue reddish shade (Bleu de Lyons) and night blue, or Bleu de lumière.

A great obstacle against a larger consumption of these blues, however, was their insolubility in water.

Many experiments for their transformation, at last led to a treatment analogous to the formation of the sulphate of indigo, and the success was a brilliant one, by the following method: 1 part blue, soluble in alcohol, is dissolved in 5 to 6 parts of common 66° sulphuric acid; the solution is heated to a temperature of 130° to 140°C., then the acid is neutralized with soda or potash, and the precipitate filtered and dried. The sulphuric acid enters by this process into the blue, and forms anilin blue-sulphuric acid.

According to the more reddish or greenish shade of anilin blue, soluble in alcohol, which is converted, the products differ in shade, and furnish the anilin blues soluble in water: blue reddish shade (Bleu de Lyons), pure blue blueish, pure blue greenish and night blue, or bleu de lumière.

If, instead of soda, lime salts are used for the neutralization of the sulphuric acid, the blues retain nearly the same shades, but acquire the property of *dyeing more easily on cotton and silk*.

The blues soluble in water mentioned so far, contain at least two equivalents of sulphuric acid (SO_3). If the sulpho blue solution is heated only to 30° to 40°C., and then neutralized with soda or caustic lye, the monosulpho salt or *alkali blue* is produced, the shades of which are distinguished by the affixes I B to V B.

The newest product in this branch, *diphenylamin blue*, is distinguished by its pure greenish tone from all other anilin blues. It results by oxalic acid being heated with *diphenylamin*, which furnishes the first product, *diphenylamin blue, soluble in alcohol*, the transformation of which into the *diphenylamin blue, soluble in water*, is effected in the same manner as above mentioned about the other anilin blues.

Through farther investigations, by the action of iodide of methyl or iodide of ethyl on roseanilin, Prof. Hofmann discovered new violets, named after himself *Hofmann Violets*, and shortly afterwards the second important product in this direction, viz., the *iodine green*.

These Hofmann Violets, on account of the so far unattained beauty and brilliancy of their color, ruled the market completely for some years in all primrose or primula (purple) hues, until by another step in advance they were again improved and surpassed in the following manner: Muriate of anilin in crystals, when mixed with anilin oil and woodnaphtha (pyrolignous spirit), and exposed to a pressure of fifty atmospheres at a temperature of 250° to 300°C., is converted into dimethyl-anilin, from which, through a simple oxidation by the assistance of chlorate of potassa or chloride of copper, the *methyl violet* results.

Through further treatment with chloride of benzyl, produced by the action of chlorine gas on boiling toluol, the bluer shades are obtained, as, *methyl violet II B* to *V B*, and by treating them with iodine, the redder hues—*methyl violet, I R* to *V R*.

In a similar manner, as the iodine violets were supplanted by the methyl violets, the iodine green, formerly predominant, and besides the little-known Chinese indigo (Luh-Chao), the only color in existence for dyeing night-green shades, has been replaced by the *methyl greens*, which result, also as a second product, from the process of making methyl violets, and are produced with yellowish and blueish hues in crystals and in powder.

Muriate of anilin in cakes (generally called anilin salt, like the muriate of anilin in crystals) serves exclusively for the production of *anilin black*, which, when mixed with other mordants (chlorate of potassa, sulphate of copper, etc.) and gum or starch thickening, and printed on cotton through a process of oxidation, gives a black color hitherto unknown in equal fastness, and therefore has become of very great importance for all cotton print works.

By introducing nitrous acid into toluidin, and subsequent oxidation by means of bichromate of potassa, there is formed another valuable color—the saffranin.

Naphthalin, treated like benzol or toluol, as above mentioned, furnishes the nitronaphthalin and naphthylamin, from the last of which, by the action of nitric acid, is produced the *Martius yellow*.

With the exception of this color, so far the naphthalin colors afforded little interest for industrial use. The possibility is, however, not excluded—in fact, it is very probable, as this hydrocarbon stands between benzol and anthracene—that in a short time we may be able to form still other naphthalin colors, which, standing between the madder and anilin colors, would unite the fastness of the former with the beauty of the latter.

Phenic acid, likewise produced by the distillation of coal tar, when treated with oxalic acid, gives *rosolic acid*, and this, under pressure with ammonia (NH_3), *corallin*.

The newest and most beautiful member of the family of these dyes is the *eosin* (Aurora). It is also a derivative from benzol, and obtained by introducing bromine into the *fluorescein* (very interesting for its play of colors), for the preparation of which phtalic acid and resorcin are employed.

The production of eosin is still in its infancy, but to judge from the results during the short time which has elapsed since its introduction, it promises to be of great importance in the future, as it not only fully supplies the place of the shades of rose-pink colors obtained with carmine of safflower, but surpasses them considerably in beauty.

The brown, known by the name of *vesuvin*, is a product of oxidation from nitrobenzol; it dyes all shades of Havana browns.

We conclude this division with the important product from carbolic acid, generally known as a yellow dye, the consumption of which is great, especially for all yellow tints on wool, and which has been introduced into the trade in two forms, both chemically pure—*picric acid* in crystals and in amorphous powder ($C_6H_3(NO_2)_3$).

VARIETIES.

ON ANTHRAFLAVON AND AN ACCESSORY PRODUCT OF THE MANUFACTURE OF ARTIFICIAL ALIZARIN. By M. A. Rosenstiehl.—The author showed in 1874 (*Comptes Rendus*, lxxix., p. 764) that the anthraflavon of Barth and Sennhofer, if melted with caustic potassa, gives simultaneous rise to two coloring matters, one of which, soluble in benzin and in alum water, dyes mordanted tissues shades bordering upon those of alizarin, whilst the other, insoluble in the same liquids, approaches purpurin; the shades obtained in dyeing are, in brightness and solidity, comparable to those of madder. The former of these colors is produced in such small quantities that its examination has not been hitherto possible. The latter is more plentiful, and is an isomer of purpurin approaching the isopurpurin or anthrapurpurin of Perkin. Anthraflavon itself is a mixture of two isomers of alizarin distinguished by their behavior with bases. The one forms a soda salt very soluble in water; it dissolves in baryta water, which it colors a deep orange yellow, combines with gelatinous alumina to form an orange lake, and if melted with caustic potash between 135° and 150° it forms the isomer of purpurin just mentioned. The other yields a soda salt sparingly soluble, and readily crystallisable; it is insoluble in cold baryta water, does not combine with gelatinous alumina, and if melted with potassa at the same temperature it does not give rise to a coloring matter; a little only is formed at a higher temperature, with the destruction of a large proportion of the substance. This second body can be obtained in the form of fine silky needles, which in bulk present the yellow color of chromate of lead, and recalls the aspect of chrysophanic acid. This body is identical with an accessory product of the manufacture of artificial alizarin from the works of Przibram & Co., of Praz.—*Chem. News*, July 14, 1876.

NEW COLOR.—Rosenstiehl has obtained a coloring matter in yellow metallic lamellæ by acting upon dry artificial alizarin with nitrous acid. With alumina it dyes yellow, and with iron mordants a red-violet, both of which colors can be brightened with boiling soap lyes. It dyes best in distilled water or with addition of acetate of lime. Rosenstiehl considers it as nitro-alizarin.—*Chem. News*, July 7th.

RESORCIN BLACK. By M. R. Wagner.—If to an aqueous solution of resorcin there is added sulphate of copper and then ammonia, enough to re-dissolve the precipitate first formed, a deep black liquid is obtained which dyes wool and silk black, and which may possibly be used as ink.—*Chem. News*, June 23, 1876.

MINUTES OF THE PHARMACEUTICAL MEETING.

A PHARMACEUTICAL MEETING was held July 18th, 1876, Edward Gaillard in the chair. Prof. Remington donated to the Cabinet from Cramer & Small, a stone jar in which balsam of tolu was imported a box which held 25 musk pods, and a sample of Persian opium.

E. M. Boring exhibited artificial oil of bitter almonds, made by Dr. F. Wilhelmi, Reudnitz, Leipsic, of which he is the inventor and only manufacturer. This substance is not to be confounded with mirbane oil, which merely smells like bitter almond oil, but it is identical as well in its composition as in its physical, chemical and physiological properties with the natural oil made from almonds, and has the great advantage over the natural oil that it is free from prussic acid, and is much cheaper.

C. W. Hancock exhibited re-sublined carbonate of ammonium as made by C. T. White & Co., which is without empyreumatic odor; also, solution of acetate of ammonium made with it, and pure acetic acid from the same firm. From long experience he finds it very grateful to the sick and much to be preferred over that made fom ordinary commercial articles—a sample of which was likewise shown for comparison.

Prof. Bedford was asked as to the use of these materials in New York; he agreed with Mr. Hancock as to the advantage of the solution when thus prepared, but would confess that here, as there, the majority of apothecaries were not aware of these facts; he also said that ammonium carbonate was now made near New York of excellent quality, and that the English manufacturers were putting down the price to compete for the trade.

E. M. Boring, having tried the thick filtering paper spoken of at a former meeting, was not prepared to confirm all the statements made, and was corroborated by Dr. Pile who thought the ordinary round filtering paper much more serviceable.

Edward Gaillard found the solution of tartrate of sodium, as made by the formula of Mr. Hayhurst ("Amer. Jour. Phar.", p. 208), was too active a purgative, but when reduced to half the strength answered well. There is a demand for this preparation, and when properly labeled and sold, will give satisfaction.

Dr. Pile had examined a number of starches on exhibition, and advised the use of the microscope for this purpose. He found the globules of Jamaica arrow root to be of the same shape and size as those of a known sample of St. Vincent arrow root; while two samples of St. Vincent arrow root obtained from New York gave about three-quarters of Bermuda arrow root and one-fourth of tapioca farina, the globules of which are much smaller and rounded; other samples of St. Vincent arrow root, obtained in this city, were all right.

Adjourned to meet August 15th, 1876, at 3.30 P.M.

WILLIAM MCINTYRE, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE RHODE ISLAND PHARMACEUTIGAL ASSOCIATION held its quarterly meeting July 10th, President Albert L. Calder in the chair.

The following members were elected delegates to the next meeting of the American Pharmaceutical Association: A. L. Calder, Charles Congdon, W. B. Blanding and W. F. Teston.

After the transaction of some routine and other business, the members with their ladies and invited guests dined at the Aquidneck House.

NEW YORK ALUMM ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The regular quarterly meeting was held on Tuesday, June 27th, in Plimpton Hall, and the attendance of members being small, was more of a social character. Some discussion was indulged in regarding Warburg's tincture, which has, of late, attracted much attention from the medical profession and press. A specimen of the tincture was presented made according to the original formula of Dr. Warburg, containing the confectio damocratis (?) which alone contains 48 different ingredients. After some further remarks, the meeting adjourned.

EDW. PLUMMER, *Secretary.*

THE PHARMACEUTICAL ASSOCIATION OF SOUTH CAROLINA, which was incorporated by act of the Legislature, approved by the Governor March 10th, 1876, was organized at Charleston, July 5th, when the following officers were elected for the ensuing year: President, G. J. Luhn, Charleston; Vice Presidents, E. H. Heinitsh, Columbia; W. C. McMillan, Marion; Secretary, C. G. Erckman, Charleston; Treasurer, Dr. H. Baer, Charleston; Pharmaceutical Examiners for Charleston —A. W. Eckel. Dr. E. H. Kellers, A. H. Schwacke, E. S. Burnham; Pharmaceutical Examiners for Columbia—C. H. Miot, E. H. Heinitsh, L. T. Silliman, W. C. McGregor.

The association, through the board of Examiners, has full power to license *pharmaceutists, apothecaries and druggists* within the State. Each of the two Boards, four members of which constitute a quorum, is constituted besides the gentlemen named above, of two other persons to be appointed respectively by the Medical College of the State of South Carolina (for Charleston), and by the Medical Faculty of the University of South Carolina (for Columbia). The Boards are elected to serve for one year.

EDITORIAL DEPARTMENT.

THE TWENTY-FOURTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will be held at the Hall of the Philadelphia College of Pharmacy, commencing September 12th, at 3 o'clock P. M. The notice of the Permanent Secretary will be issued early in August, and give information in regard to the hotel accommodations provided for the visiting members. It is not unlikely that the hotels near the College building may then be well filled, since numerous conventions and society meetings will be held in Philadelphia about the same time. Ample accomodations, however, can be had within a convenient distance from the place

of meeting, with private families and in boarding houses, where full or partial board may be obtained; or rooms may be had without meals. For the convenience of those desiring such accommodations, a list will be kept at the College building, and may be consulted by all visiting members, between the hours of 9 A. M. and 6 P. M., when the Actuary of the College will be in attendance to give all desirable information to strangers, it being the desire of the College, that the building be used by its friends as a place of rendezvous while the Exhibition is in progress. Those members who are desirous to secure rooms in advance, may address the Permanent Secretary, stating full particulars.

The arrangements for visiting the Exposition are ample, there being communications by steam every few minutes between the centre of the city and the Exhibition Grounds. The Committee of Arrangements will, at the first session, submit a plan for visiting the Exposition, with the view of facilitating the examination of the numerous objects of interest, without conflicting with the business that may be brought before the Association.

INVITATION TO THE PHARMACISTS OF FOREIGN COUNTRIES.—The following invitation has been issued, in compliance with a resolution passed by the American Pharmaceutical Association at its twenty-third meeting. The invitation was sent to the general or prominent local pharmaceutical societies of the various countries, and has been brought to the notice of their members. From some acknowledgements received since, it is expected that a number of foreign pharmacists will make it convenient to visit this country at the time, and be present at the meeting of the National Association. The document referred to is as follows:

AMERICAN PHARMACEUTICAL ASSOCIATION,
Office of the Permanent Secretary,
PHILADELPHIA, May, 1876.

To the President of the ——

HONORED SIR—The International Exposition has just been opened in the city of Philadelphia, and during its progress the American Pharmaceutical Association will hold its Twenty-fourth Annual Meeting in the same city, on the 12th day of September next. It is hoped that many pharmaceutists and druggists of your State will embrace this opportunity to pay a visit to the United States, and we take great pleasure, on behalf of our Association, in cordially inviting them, through your honorable society, to so make their arrangements as to meet this Association at its next Annual Meeting.

It likewise affords us pleasure to inform you and the members of the society which you represent, that the Philadelphia College of Pharmacy has opened a bureau where information such as may be desired by strangers will be freely given to all visiting pharmacists and druggists daily, between the hours of 9 A. M. and 6 P. M.

Hoping to meet you and many colleagues of your country in September next, we have the honor to remain, dear sir,

With fraternal greeting,

GEORGE F. H. MARKOE,
Pharmacist in Boston, President Amer. Phar. Assoc.
JOHN M. MAISCH,
Permanent Secretary.

REVISION OF THE U. S. PHARMACOPŒIA.—The permanent Committee of the American Pharmaceutical Association has had this subject in consideration, and desires the co-operation of all pharmacists who are willing to contribute their experience or otherwise aid the committee; such communications, it is desired, should

reach Prof. P. W. Bedford, 10 Gold street, New York, before September 1st. The following circular embraces some suggestions relating to the next revision of the Pharmacopœia:

NEW YORK, May 15th, 1876.

To the Members of the Committee on Revision of the U. S. Pharmacopœia:

At the meeting of the committee held during the sessions of the Association in Boston, September, 1875, the undersigned were appointed a sub-committee to devise and prepare a plan of revision, which should be submitted for the guidance of the committee in their labors.

They respectfully report to the committee the following plan for the work of revision:

Each member of the committee should ask for the co-operation of the College of Pharmacy or Pharmaceutical Association which he represents in this committee, and secure their aid in the work of the committee.

Each member of the committee is requested to come prepared to discuss such modifications and changes in the U. S. Pharmacopœia, as may be deemed advisable by himself, or the Association he represents.

The committee are requested to meet on the morning of Wednesday, September 13th, at the call of the chairman, for such business as may be brought before the committee.

Your sub-committee recommend the following changes in the next edition of the Pharmacopœia, and suggest to the members of the committee, that whatever work be attempted before the meeting of the committee, be made to correspond to these recommendations;

1st.—That all measures of capacity be abandoned.

2d.—That all substances be weighed, and that the quantities be given in parts.

3d.—That all substances in the U. S. Pharmacopœia be arranged alphabetically.

4th.—That the botanical descriptions be made more exact and complete.

5th.—That the formula for the manufacture of chemicals which are recognized as produced entirely by manufacturing chemists be omitted, and that a description of the chemical be substituted with such tests as shall be conclusive as to its identity and purity.

6th.—That it is desirable that there should be a larger number of tables for reference introduced in the U. S. Pharmacopœia.

PAUL BALLUFF,
P. W. BEDFORD.

The chairman makes the following appointment of sub-committee:

Botany, Vegetable and Animal Materia Medica.

PROF. C. L. DIEHL, Chairman. PROF. G. F. H. MARKOE. PROF. W. T. WENTZELL.

Chemistry.

PROF. J. F. JUDGE, Chairman. PROF. P. W. BEDFORD, Chairman.
WILLIAM SAUNDERS, C. A. TUFTS,
A. E. EBERT. J. C WHARTON.

PROF. J. FARIS MOORE, Chairman. W. S. THOMPSON, Chairman.
PAUL BALLUFF, C. H. DALRYMPLE,
A. B. TAYLOR. W. H. CRAWFORD.

P. W. BEDFORD, *Chairman.*
C. LEWIS DIEHL, *Secretary.*

OBJECTS OF HISTORICAL INTEREST AT THE CENTENNIAL EXPOSITION.—The Franklin Institute of Penna., has opened a reception room at the northwestern end of Machinery Hall, for the use of all interested in the mechanic arts. Besides files of the Journal of the Institute and other periodicals devoted to the industrial arts, which may be consulted by the visitors, the following objects of great historical interest, have been placed in the room:

1st. *Franklin's Electrical Machine.*—This instrument is doubtless the one used by the great philosopher in making his wonderful experiments in the science of electricity. Presented to the Institute by Dr. John R. Coxe.

2d. *Oliver Evans' Steam Locomotive Engine.*—This interesting model is among the earliest known, having been built about 1804.

3d. *Oliver Evans' High Pressure Steam Engine.*—This is the model of an engine built by O. Evans, about 1804, and is described in Galloway's work on the Steam Engine, page 101.—London, 1827.

4th. *Working Model of a Steam Engine* built by W. W. Baldwin, and presented by him to the Institute, about 1832.

OBITUARIES.

CHRISTIAN GOTTFRIED EHRENBERG, the celebrated naturalist, died at Berlin, Germany, June 28th, in his 82d year. He was born at Delitzsch, April 19th, 1795, and studied at first theology, afterwards medicine and natural science. In 1820 he accompanied General Minutoli to Egypt, returning from his oriental travels in 1826, while his colleague and friend, Dr. Hemprich, died during the voyage at Massaua, 1823. In company with Humboldt and Gustav Rose, he undertook, in 1829, a journey to Siberia as far as the Altay Mountains. Since 1827 he has been attached to the University of Berlin, where, commencing in 1830, his various celebrated works on the infusoria were written, through which he disclosed a new, hitherto almost unknown world of minute creation. On the occasion of the semi-centennial anniversary of his promotion to the doctorate, November 8th, 1868, the American Pharmaceutical Association, in common with many other learned societies of the civilized world, offered to the celebrated explorer their felicitations

Ehrenberg retained his intellectual vigor and pursued his favorite studies to the last. His last work, containing microgeological studies on the minute life at the depth of the sea, appeared 1873.

WILLIAM GRAHAM MACIVOR, director of the government plantations at Ootacamund, Neilgherry Mountains, East India, died there recently. The great success from the very beginning of the transplantation of the cinchonas to India is mainly due to his excellent judgment, close observations and sagacious management. Flückiger and Hanbury speak of him that, in connection with the Neilgherry plantations the name of him must always be remembered, who, by his rare practical skill and sagacity in the cultivation and management of the tree, has rendered most signal services in its propagation in India; and Soubeiran and Delondre recognize his services in saying: "Si en effet Mr. Markham a été la tête de l'enterprise, Mr. MacIvor en a été assurément le bras."

ALBERT C. CURTIS.—We regret to learn of the sad fate of this promising young man, who was murdered about the last of June, near Laramie City, Wyoming Territory. He hailed from Ashland, Ohio, where he learned the drug business under the instruction of Dr. W. K. Foltz. In 1871 he graduated at the University of Michigan, and in 1872, at the Philadelphia College of Pharmacy. Subsequently he served as Assistant in Cleveland, which city he left a little over two years ago, and owing to failing health removed to Wyoming Territory. An abstract of his thesis was published in this journal 1872, p. 485.